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Vol. 160, No. 8

August 21, 1947

Editorial

Of Things to Come 59

Technical Articles

The Foundry Atmosphere 62
Inert-Arc Welding With Direct Current 68
Greater Output per Dollar 71
Small Scratch-Recording Strain Gage 73
Plating Problems Discussed at AES Annual Meeting 74
Redesign Increases Mill Motor Ratings 78
Offset Machines Produce Wood Grain on Steel 80
New Equipment 85

Features

Fatigue Cracks 46
Dear Editor 50
Newsfront 61
Assembly Line 90
West Coast 94
Washington 98
European Letter 102
Personals and Obituaries 106
Industrial News Summary 110
News of Industry 113
Gallup Polls 119

News and Markets

Royall Asks Industrial Mobilization Planning 122
Old Open Pit Mine and Foundry Sold 123
Sponge Iron Process Held Ready for Emergencies 124
Belgian Wage Demands Worry Steel Leaders 127
French Alloy Steel Output at 40 Pct 128
Washington Is Swamped With German Documents 129
Announces Detailed Machine Tool Program 130
Industrial Briefs 138
New Construction 139
Machine Tool Developments 140
Nonferrous Market News and Prices 142-143
Iron and Steel Scrap News and Prices 144-145
Comparison of Prices by Week and Year 146
Finished and Semifinished Steel Prices 148
Alloy Steel Prices 149
Warehouse Steel and Pig Iron Prices 151
Ferroalloy Prices 152

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Index to Advertisers 203-204



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Of Things to Come

THAT the European economy is desperately ill is a subject made almost commonplace and irritating by sheer repetition and over-worked cliché. The patient admits of slowing of pulse and pains in the stomach. The rich relative clucks solicitously over the contagious aspects of the malady. As would be expected, the economic and political doctors are somewhat at odds as to diagnosis and medication, and there is always that element of danger that the patient may pass to the left of the iron divide while the doctors disagree. However, it does seem that the dollar and occupational therapy being devised in Washington and Paris may well see the patient through to a viable and self-supporting future, although somewhat shaken of limb and short of breath.

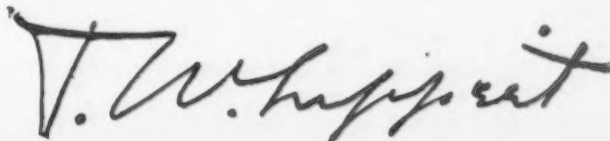
The Anglo-American conference in Washington on Germany, and the 16-nation Economic Conference in Paris—and, also, Secretary Marshall's private talks to Congressional groups—rate a historical footnote if for no other reason than that there have been none of the usual leaks of information to the press. But of signs and portents there are plenty. The carefully-worded announcements of the next several weeks should come as no great surprise.

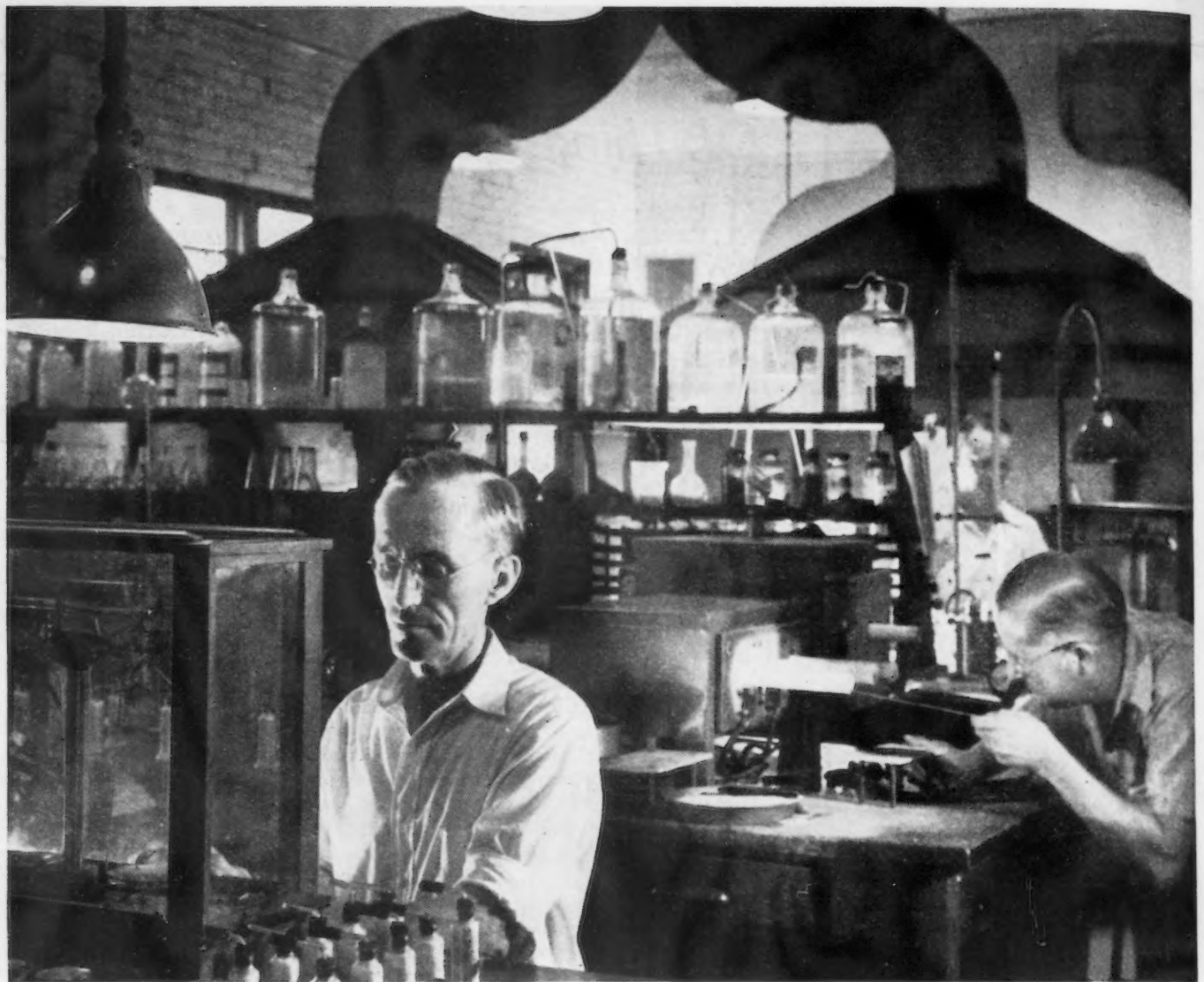
The United States is committed to a new "forward" policy in Germany despite British doubts and French fears. The old Morgenthau pastoralization plan has given way to the State Department's new directive for "a strong and prosperous Germany" to General Clay (who, as was the case of General Clark in Austria) loses much of his bumbling autonomy. It will remain to be seen whether the promises of increased United States food allotments and machinery will get the coal and steel out of the Ruhr that will pace European recovery.

In Paris the grim visage of Mr. Molotov glowers over the shoulder of each delegate from the 16 Western nations. The Scandinavian countries (Sweden's delegate is called "a frightened man"), the Benelux group (Belgium, Holland and Luxembourg) somewhat smug in their customs union, Switzerland (which is dollar rich), and France (with a powerful communist party) all are fearful of offending Russia and unnerved at the prospect of being pawns in the American-Russian tug-of-war. They labor mightily for the appearance of economics utterly divorced from politics. It is Britain (ever conscious of the fleeting opportunities of history even though facing a political upheaval at home) that keeps beating down all the awkward obstacles to press toward workable agreements.

The four-year plan, when announced, will desperately twist and turn to avoid the appearance of being a Western bloc, which is precisely what the United States wants it to be! While being a far cry from Mr. Churchill's United States of Europe, the pressure of common frustration will force a mutual-aid pattern having some merit. Of necessity, the précis will lay down rudiments of exchange of surpluses and raw materials, list the help necessary from the United States and devise a credit pool to administer this help, and (most important of all) set up a plan for inter-convertibility of the currencies of the 16 participating nations. This latter will involve some painful individual currency revaluations, halting of inflation (which even in the United States seems to be an elusive juggernaut) and subsequent financial rehabilitation completely dependent upon powerful dollar support.

The resultant demands on the United States economy and materials in short supply may be less drastic than expected, on the order of \$4 billion yearly for three years. But, Congress may well find it a delicate problem indeed to devise executive powers necessary to fully implement this policy of enlightened self-interest—not easily will they stop their ears to cries of anguish and rage, and pluck from the economy the wheat, coal, steel and machinery that will be listed in such precise detail.





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- ▶ Side blown converters are receiving careful study by steel producers. The experimental 22-ton unit formerly at Jones & Laughlin's Aliquippa works has been obtained by U. S. Steel, which will operate the vessel at its South Chicago plant. Battelle Memorial Institute has been awarded a research project on it by the corporation and a long term investigation is planned.
- ▶ The biggest show in New York last week was the first New York public showing of the Tucker '48 at the Museum of Science & Industry. More than 125,000 people actually paid to see it and thousands were said to have tried to place orders.
- ▶ Relatively low cost Swedish iron powder has forced at least one American producer to withdraw--perhaps only temporarily--from manufacture of the product.
- ▶ Automotive makers are going over new car designs with a fine-tooth comb attempting to substitute other materials for steel. Plastic trim will be more in evidence next year than ever before.
- ▶ More than \$12 billion will be spent for new plants and equipment in 1947 if present plans of American industry are carried out, according to an analysis by the Cleveland Trust Co.
- ▶ The cost of using oxygen to improve steelmaking still contains many unknowns, but one producer recently said that to pump air into the large furnaces at present costs \$1.50 per ton of contained oxygen in air.
- ▶ A 1947 Buick sold for \$26,000 in London early this month. The 10-hp British cars cost about \$2000 new. And if legal tangles could be worked out one could sell a second-hand Olds Hydra-Matic for \$12,000 regardless of condition.
- ▶ Instead of using decals to impart a grained wood-like surface to steel for interior body parts, Fisher Body's Ternstedt Div. uses cylindrical offset printing rollers. This has practically eliminated rejects. The same number of girls now produce twice as many parts per hour by the new method.
- ▶ The Swedish Saab Aircraft Co. plans to build a 1540-lb 2-door streamlined car of the front wheel drive type. The first body press has already arrived there from the United States and production is slated for early 1949.
- ▶ Stainless steel powder base paints and lacquers, though commercially available now, are being studied for more anti-corrosive applications. Their use on fans exhausting nitric acid fumes is said to have prolonged blade life from 2 weeks to 24 weeks and they are now being tried experimentally for painting ship bottoms.
- ▶ The American air lines which rapidly expanded from domestic to overseas operations after the war and have since suffered successive financial reverses are now feeling happier about the expansion. The passenger load factor in international operations is proving more consistent than it is domestically, and shows promise of salvaging several firms which might otherwise be in desperate financial straits.
- ▶ The Russians report a process by which peat used for power stations provides a gaseous fuel for heat, while the peat residue is used to make synthetic gasoline. It supposedly reduces synthetic gasoline costs by 18 pct while cutting peat consumption by 30 to 35 pct.
- ▶ Offers by Italian diplomats to integrate the economy of their country with that of France at the expense of the Italian steel industry, have been rejected in Paris. Present plans for cooperation under the Marshall Plan call for increasing Italian steel output to 3 million metric tons and pig iron to 600,000 metric tons a year.
- ▶ The British Iron & Steel Board warns those planning to enter the foundry industry that they may not get the pig iron they need. Owing to short supply, raw material licenses may not be given to new companies.
- ▶ Restoration of the iron ore mines in the Krivoi Rog district of the USSR, destroyed by the Germans in the invasion, will mean 7,200,000 tons more iron ore from them this year than they yielded in 1946. Six "large" ore dressing plants are under construction and new mines are being sunk along the former bed of the Saksagan River.

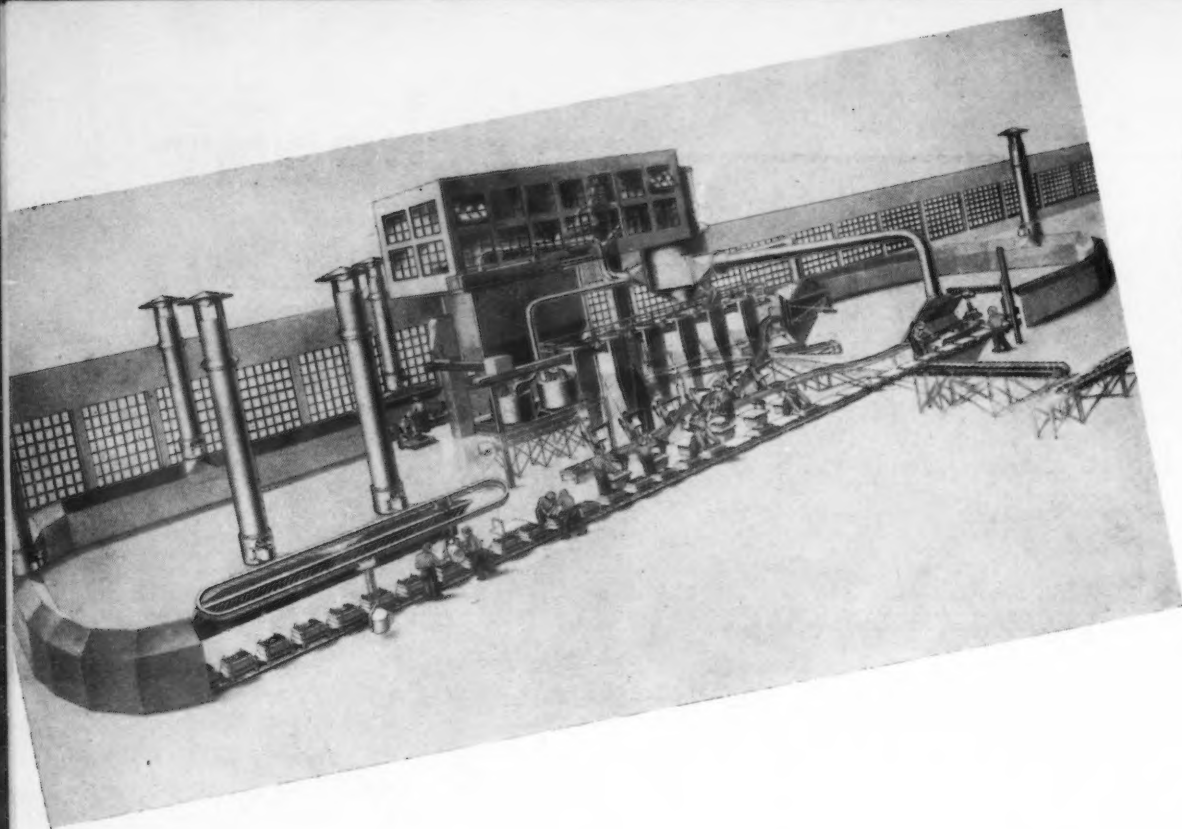


FIG. 1 — A complete mold conveyor unit with ventilated pouring station, cooling tunnel, shakeout stations, and sand conditioning equipment. Photo courtesy Claude B. Schneible Co.

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THE pressure on the foundry industry to control the sources of air contamination has steadily increased, not only with a growing knowledge of occupational diseases, but more specifically with the increase in the tonnage of castings produced per unit of foundry floor area.

This discussion is not concerned with the problems of ventilation design, but is rather directed to an examination of the prospects of improving the somewhat unwholesome reputation acquired by the modern production foundry.

Small foundries can and will profit by examples of dust, fume and smoke control offered by the larger plants. It is also true that the smaller foundries will, of necessity, be required to exercise unusual caution in investing large sums in ventilating equipment and will be able to profit by methods of air control that have proved successful in high production plants.

From the viewpoint of public relations, the foundry atmosphere has at least three interpretations. First, that represented by the vague impression apparently circulating among the public that an exceptionally disagreeable atmosphere characterizes the modern production foundry; second, the belief that respiratory diseases of many sorts are encountered in a foundry career and that smoke and gases run wild throughout the workspace; and third, the conviction among property owners that the neighborhood of a foundry will inevitably be peppered with cinders, fly-ash, and sand, or the outdoor atmosphere thoroughly polluted with disagreeable smoke, fumes, and gases.

The first item is outside the scope of this ar-

Control of dust, fume and smoke in the foundry is a problem demanding more and more attention from management. Its importance, not only to employee relations, but to production costs, is acknowledged, but a lack of understanding of the true nature of the specific ventilating problems involved has tended to delay widespread use of available dust control equipment. This article gets to the bottom of the foundry ventilation problem in a practical, commonsense manner, and offers means of improving atmosphere conditions while at the same time dispelling many common misconceptions concerning ventilating techniques.

ticle. It deserves a great deal of attention, nevertheless, by those who specialize in the field of public relations. Items two and three form the subject of this current analysis.

In the public mind, a foundry seems to epitomize all those undesirable aspects of working conditions. The expert can find numerous examples of undesirable working conditions in heavy industry, but to thousands of uninformed citizens, popular writers, and artists, the foundry is more nearly synonymous with "dust, dirt, smoke, and heat."

Most of us realize that none of these impressions is correct for the majority of production foundries. We also realize that dramatic conditions in a few foundries provide the most interesting material for conversation.

Although all foundry operations, both ferrous and nonferrous, involve sand (excluding some permanent mold operations), the iron foundry is specially noted for the very black, finely powdered sea coal used in molding sand. The differ-

The Foundry Atmosphere

By WILLIAM N. WITHERIDGE

*Ventilation Consultant,
General Motors Corp.,
Detroit*

ence made by the absence of sea coal was quite apparent during the war years in the new aluminum and magnesium foundries. Sand, clay, and dust were likely to be scattered more or less widely according to the degree of control exercised, but they did not leave the telltale black smudge that only sea coal can produce.

Appearances are quite apt to be deceiving so far as respiratory disease exposures are concerned. The fine silica dust in the range of 1 to 10 microns, which is the particle size range represented by existing standards of allowable dust concentrations, is invisible to the naked eye. In strong illumination the airborne particles may be seen by the Tyndall beam effect of light reflection, but dust concentrations potentially dangerous to breathe are not essentially visible. Smoke does not show up in standard dust counts, although it creates most of the visual haze in a foundry.

A foundry that seems to be a dirty place because of the confusion and sand spillage around the floor may have high rates of ventilation that keep the 1 to 10 micron dust at a safe concentration. Another foundry with highly mechanized operations and a superior housekeeping policy may allow dangerous invisible amounts of exceedingly fine dust to escape from a few processes so that actual dust counts on air samples are too high for safety.

One of the points unknown to the general public is that recent appearance of silicosis in a foundryman is not unquestionable proof of hazardous conditions now existing. First, only in the last few years have large numbers of foundry workers been carefully examined for occupational lung disease. Second, silicosis is a disease that may take years to show up on the chest Xray, or as a disability in lung function, and it is safe to say that most of the cases of silicosis now discovered in foundries represent the poor or nonexistent dust controls of years ago. Carefully conducted air tests in foundries establish their current success in maintaining safe atmospheres.

Nevertheless, it is exceedingly difficult to convince new prospects for foundry work that they are applying for a job in a plant maintaining healthful atmospheric conditions, if they learn that one of the workers has just become disabled by silicosis contracted years earlier, and possibly even at a different plant.

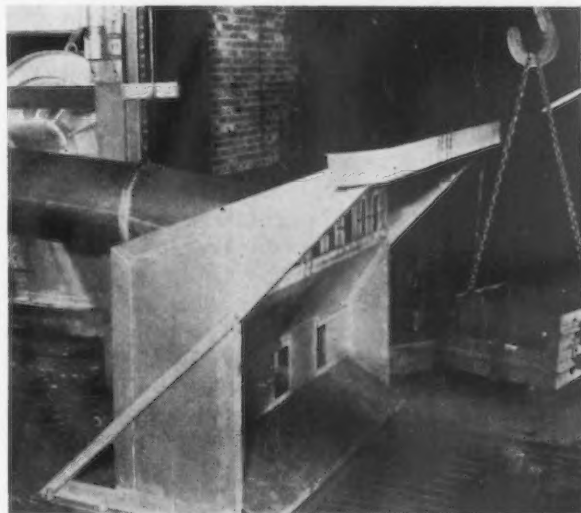
There are, of course, a few foundrymen alive

today who have never had their own chest Xrayed, and because they are not yet aware of any disability, do not believe there is such a disease as silicosis. Others, better informed, radiate the impression that silicosis is possible in other plants, but certainly not in their own. Silicosis is possible, in *any* foundry where maintenance is inferior; constant vigilance is necessary to keep the dust control program running smoothly.

Workers and management alike have gradually discovered that reasonably clean atmospheres can be maintained in production foundries. The most progressive companies, both large and small, have been responsible for this discovery, because until it was demonstrated in actual operation, the theoretical possibility of atmospheric cleanliness was not particularly convincing.

This problem does not involve disease or disablement in most cases, but simply with the problem of competing with other kinds of industry for a labor force that is not so highly specialized that it cannot shift readily from job to job and plant to plant. It is not necessary for relatively unskilled labor to remain in the foundry on unskilled jobs; there are many places in modern industry where machines do most of the work. All other conditions of work being equal, the average job hunter will naturally try to join the force in a plant having the reputation for the most comfortable environment. The handicap to

FIG. 2—A sidedraft shakeout hood with sliding panels for airflow adjustment. Photo courtesy American Air Filter Co.



the foundry industry is obvious. A program of competitive improvement may require years to complete, and it is possible that labor turnover will continue high for some time.

There is a substantial degree of labor-saving mechanization in the modern production foundry, another point about which the public is not well informed. Much of the heavy lifting characterizing the foundry of earlier years has been turned over to compressed-air devices. Conveyers have gradually appeared in even the smallest establishments. Automatic abrasive-cleaning equipment eliminates some or all of the work formerly done in rapidly ventilated rooms by men rigged out like deep-sea divers. Sand handling and conditioning equipment is operated by a few men whose work stations are well ventilated, and who might accidentally be exposed to excessive dust only in the event of a mechanical breakdown.

Atmosphere control has advanced somewhat in proportion to mechanization and attention to operation sequence and layout. Fortunately, the conveyerized foundry proved to be even easier to provide with effective dust control than the jobbing or floor-molding shop. The transition was not immediately successful, however, because the techniques of local ventilation for industrial processes had yet to be perfected. In fact, some of the best lessons in this field were learned in the high production foundry, where the real threat of silicosis on a large scale had impressed professional and executive personnel alike. It is furthermore necessary to credit the most successful developments in foundry process ventilation to the foundrymen themselves, for they alone were in the position to evolve methods that did not interfere with their basic job of producing castings. The record of ventilating engineers in some foundries would be even more deplorable than it is, if it were not for the patience and ingenuity of foundrymen who salvaged the best features of the ventilating equipment and gradually built up a complete system of ventilation that could be tolerated and maintained.

The record is not altogether complimentary to foundrymen in all plants, because in numerous cases their misconceptions about ventilation could not be dispelled by the ventilating engineer, or they frequently were not convinced that better atmospheric conditions in foundries were an earthly possibility without operating in the red.

One of the prerequisites for more automatic equipment in the foundry of the future will be careful attention to the disastrous effects of quartz abrasive so finely divided that it is invisible when suspended in air and can travel with the slightest air currents into the remote recesses of expensive machinery and automatic controls. In other industries it has been demonstrated that the human being can successfully dispose of small quantities of air contaminants without harm to health that would destroy precision equipment in a disturbingly short time, or would damage products and increase the percentage of scrap. There is little hope of economical and trouble-free mechanization with electronic control devices if the fine sand dust is not kept under rigid control.

Considering the fact that practically every operation and piece of equipment in the production foundry that creates air contaminants has been subjected to successful ventilation in one place or another, it is rather appalling to find so many ineffective and badly designed ventilating systems in this decade of engineering achievement. It is no wonder that ventilation to many foundrymen is a word spoken with a sneer, and may refer to a maze of junk suspended overhead that accumulates heavy loads of the very dust it is intended to carry away.

Part of the difficulty, in justice to some designers, is the fact that a system of ventilation is installed by an outside contracting and engineering firm, and is rarely if ever seen again by the original designer. The plant management accepts the installation without much question,

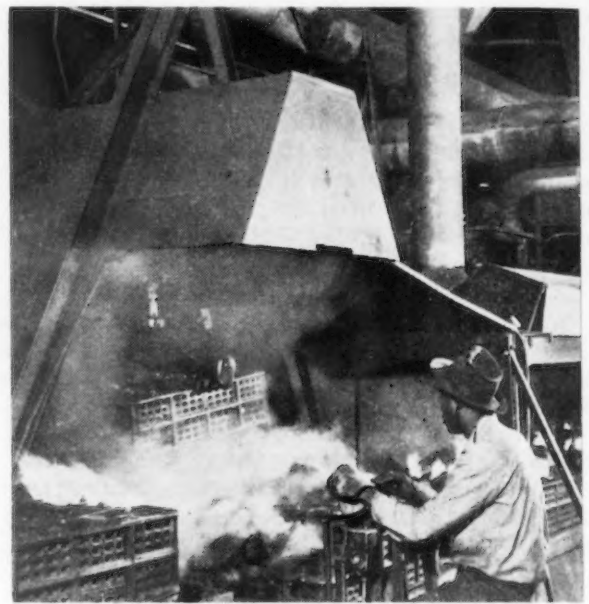
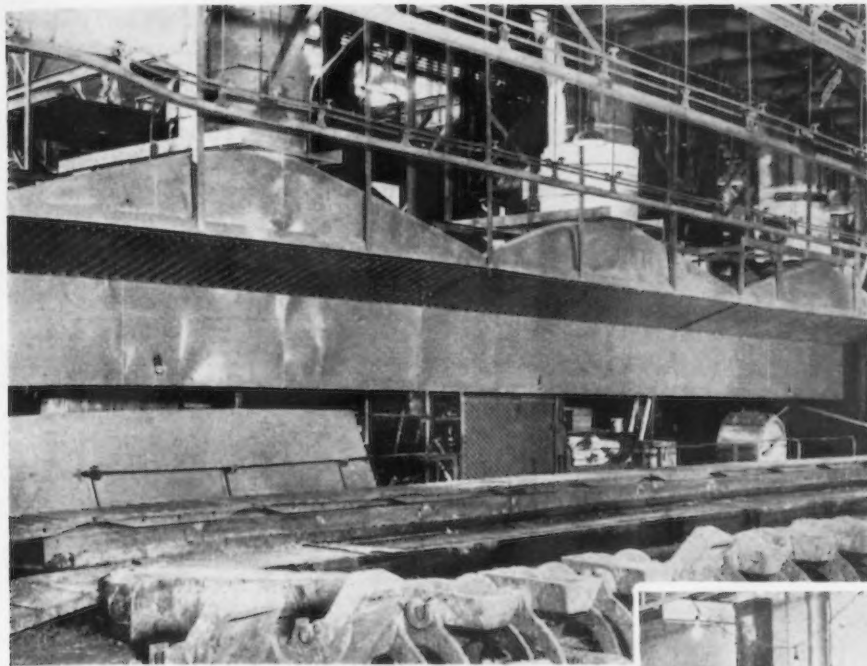


FIG. 3—An unusual form of shakeout exhaust hood. Note the air-operated cope lifting and traversing hoist. Photo courtesy Studebaker Corp.

and thereafter lets it gradually deteriorate to a point of uselessness. Little is done in the way of maintenance until the dust conditions become somewhat intolerable, because a ventilating system is nonproductive capital equipment in a class quite different from the high-pressure blower that supplies air to the cupola. Occasionally it takes a silicosis compensation suit to remind the owners that inoperative ventilating equipment is expensive baggage; that it cannot earn its own storage charges.

"In our older low production foundries, the molds were made in the morning, the metal was melted and the molds poured in the afternoon, and the castings were shaken out and the sand conditioned by a night crew. The periods when smoke and dust were given off lasted but a short time and natural ventilation through the roof and windows was sufficient. In those foundries the molders did not usually work at one job the entire shift, but poured their own molds in the afternoon. The same was true of the shakeout



LEFT

FIG. 4—An overhead system of ventilation for the pouring section of a conveyer which does not interfere with the monorail for ladles. Photo courtesy Claude B. Schneible Co.

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BELOW

FIG. 5—Ventilated chipping bench with hoppers and receptacles for heavy waste materials.



men and sand conditioners. The dust and heat created in the afternoon was dissipated by the time the molders came to work the next day and the surrounding air was clear. It is true that dust and dirt accumulated on the roof trusses and equipment, and it is also true that silicosis was more prevalent, but little was thought of these items at that time." (John Linabury, at American Foundrymen's Assn. meeting in Detroit, March 1946.)

A dilemma or paradox is evident in the wintertime operation of old foundries. During severe weather, an abundant measure of general ventilation seems to exist when judged by the drafts and low temperatures. When judged by the accumulation of smoke and dust, the closed windows, doors, and monitors create a striking difference in the atmosphere compared with summertime operations with everything wide open. Consequently, the objections to increased general ventilation created by mechanical systems or fans are greatest in the cold climates. Furthermore, increased ventilation cannot occur unless the air removed is replaced by nearly equal volumes of outdoor air. If the air supply is through windows and monitors, drafts and low temperatures develop. If air is supplied mechanically for a system of general ventilation, heating coils can be included in the fan system, but the fuel consumption shoots up and in some plants the additional heating costs are noticeable to say the least.

A disturbing consequence of the gradually increasing rates of mechanical ventilation considered necessary in the best foundries, is the effect it has had on any remaining natural ventilating equipment. In the wintertime, when barely enough air is admitted to the building, to satisfy the demand of exhaust fans, a tendency to develop slight negative pressures occurs in the space, which may even be great enough to exceed any available thermal updraft in natural ventilation stacks. The inevitable result is that air comes *down* these stacks, and the air contaminants they should be venting to the out-

doors are effectively spread throughout the building interior. Air can even be drawn in reverse through low-pressure fans used for general ventilation, by local exhaust fans capable of creating a suction ranging up to 10 or 12 in. on the water gage. The stage is reached in some plants where potential air exhaust volume far exceeds the air supply—creating air bound buildings in the winter, and actually preventing the required ventilation rates for successful dust or smoke control.

The most significant progress in industrial atmosphere control has been in the direction of local as opposed to general ventilation. Considerable pressure exists in the cold climates to find effective methods of dust and fume control that do not remove such large volumes of air as are necessary with conventional general methods of aeration.

"In every case where control of dust, fumes or smoke is involved, the ventilation engineer makes an effort to isolate the operation and apply local exhaust ventilation. Where this system can be used, exhaust volumes will be a small fraction of the air requirements for general ventilation and the results will be more positive and dependable than can ever be obtained by the dilution method necessary in general ventilation practice." (John Kane, at the University of Michigan, October 1945.)

As an example, nearly all the equipment for

the various steps in sand conditioning lends itself to effective enclosure to confine the dust, and relatively small and conveniently predictable amounts of exhaust are required to keep any leakage inward from the surrounding atmosphere. The effects of poor maintenance show up most rapidly with this equipment, and the disinterest of maintenance crews may allow much dust to escape when servicing and inspection doors or hinged panels are left off or open. The quantity of dust in terms of millions of particles that can escape during a few minutes through the door of a dusty enclosure is really tremendous, and is sufficient to contaminate hundreds of thousands of cubic feet of air in a short time to a concentration well above the limit considered safe for breathing.

A constant source of controversy is the counteraction of radiant heat by the use of man-cooling fans or ducts. The dust control engineer wants these sources of air turbulence removed from the vicinity of exhaust hoods, as at shake-out operations, in order to avoid the airflow contest between man cooler and exhaust hood; the exhaust hood usually comes out second best in such a contest. The workers, however, are quite unsympathetic to any reduction in air movement near hot stations, and are especially violent in their expressions of dissatisfaction during the

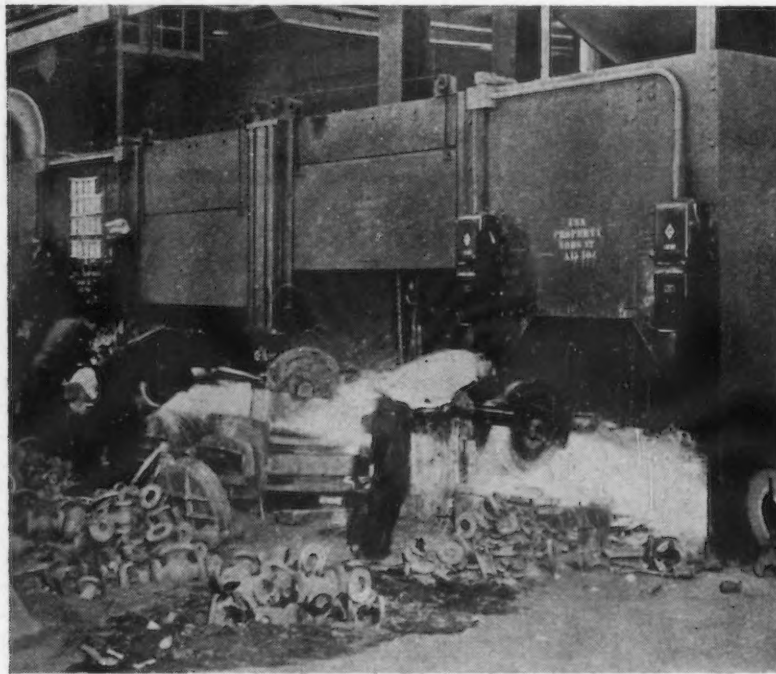


FIG. 6—Ventilated booths for swing-frame grinders. Fine dust is carried away by the air current into the booth, while heavy particles fall to the floor. Photo courtesy American Air Filter Co.

summertime. What then is to be done with such contradictory requirements?

The answer lies in the study of radiant heat sources and their layout with respect to workers so that shields can be interposed between worker and heat source. Until this is done wherever physically possible, the quantities of local ventilation to control dust and smoke will be exorbitantly high, high enough to compensate for the extra

air turbulence created to offset radiant heat. Existing standards of ventilation for foundry operations are quite useless in the vicinity of man-cooling fans. If radiant heat cannot be shielded in a given work station, the heat absorbed by workers must be removed by air currents. If the air currents cannot be directed against the workers without stirring up dust and smoke, the exhaust hoods in the area have an extra load to handle. By such an analysis, the ventilation requirement of a smoke or dust hood may be determined in part by the severity of uncontrolled radiant heat, as well as by the quantities of dust and smoke generated.

Local ventilation is imperative if dust separation or air cleaning is desired. Only by leading the air to a dust collector by a system of ducts can the particulate matter be properly separated from foundry air. General ventilation allows the dust to wander aimlessly through the space before it either settles on equipment or reaches one or more ventilating flues.

The dangerous nature of foundry dust makes it necessary in most cases at present to discharge cleaned air outdoors instead of recirculating it to the foundry. The commercial air cleaners are able to remove enough dust from the air so that it will not constitute a hazard or nuisance if winds or eddies carry it back into the plant.

Future developments in dust separators, such as electrostatic precipitation following one or more stages of preliminary cleaning, may make recirculation both practical and safe even when the contaminant is silica dust.

Recent developments in methods of heat conservation have indicated the feasibility of by-passing foundry atmospheres in cold weather by the delivery of outdoor air direct to a process enclosure and passing this air through local exhaust and air cleaning devices. Of course, workers would not be stationed in these cold-air enclosures. The possibility and consequence of moisture condensation inside the enclosure has to be carefully studied before the method is tried.

Building design has influenced the progress of atmosphere control. Buildings are tighter in the cold climates, and natural ventilation is thus reduced. Skylight and monitor design have improved, and architectural engineers are learning more about the best ways to take advantage of wind forces

to ventilate industrial buildings. Better knowledge on the part of ventilating engineers concerning the nature of such forces as wind and heat has clarified the limitations of natural ventilation for foundries. It has also demonstrated that a system of mechanical ventilation is liable to be quite ineffective, if the designer does not compensate or counteract the strong forces produced by meteorological events.

The following processes have been equipped with successful ventilation with adequate frequency to demonstrate that the results are not accidental. The atmospheric environment of these processes can be made definitely satisfactory to any reasonable critic. Anyone who claims the skill to ventilate a foundry process so that no dust or smoke will escape is not in complete control of his own judgment. He does a distinct disservice to industry or the public if he leads them to expect such a result. All standards of ventilation and allowable dust concentrations now recognize the fact that human beings do not require, and in fact will not get, strictly dust-free air in the foundry industry, or anywhere else.

Sand handling and conditioning equipment, including transfer points on belts or conveyers, shakeout hoppers, elevator enclosures, vibrating or rotating screens, magnetic separators, mixers or mullers, and storage bins. Rates of ventilation are adjusted not only to control dust escape, but also to remove undesirable fines at certain stages and avoid excessive loss of useful ingredients at other stages.

Molding and core making equipment or stations, particularly where dry facing compounds are used. Use of non-silica parting compounds simplify the problem because the required degree of ventilation control is accordingly reduced. Special attention is given to careful location of compressed air release jets that tend to stir up dry sand.

Core and mold spraying, dipping, baking and cooling equipment. Ventilation is required to remove irritant gases or vapors and in some cases to prevent a flammable vapor hazard. Silica flour sprays are locally ventilated to prevent harmful exposure to silica dust. Cooling areas outside the baking ovens are handled by general ventilation.

Furnaces of various types; such as pit or tilting crucibles, electric arc, and cupolas. The possibility of successful natural draft methods of ventilation is greatest in this section of the foundry, if properly isolated, but small furnaces in the main foundry areas usually require motorized local exhaust systems.

Pouring stations on a conveyer or at a few designated areas. The pouring of molds at many points around the foundry floor has so far defied the best efforts at local exhaust ventilation. The inherently wasteful method of general ventilation is still the conventional procedure for nonconveyerized foundries. Elaborate local exhaust devices are more costly in the long run than consolidation of pouring areas.

Cooling tunnels between pouring and shakeout stations on a mold conveyer. Such tunnels have a tendency to collect a film of greasy combustible material on the interior, and are constructed in a manner that will resist the occasional planned or unplanned burnouts.

Mold opening, cope and drag shakeout, casting vibration and core knockout. Shakeout grates with capacities as large as 90 tons have been successfully ventilated.

Tumbling mills are ventilated at a rate sufficient to prevent dust escape and to remove quickly the fine particles that would cushion or slow up the cleaning process.

Abrasive blasting operations, whether hand operated or done in automatic equipment. Sand, grit or shot-blasting rooms are not ventilated to a degree that would permit workers to breathe



FIG. 7—Ventilated enclosure over sand plows above storage bin. Two hood sections have been opened for inspection. Note 4-in. slot along the floor level of enclosure. Photo courtesy Buffalo Forge Co.

the room air, but only to permit visibility of work and prevent the escape of dust to surrounding areas. Operators are required to wear helmets furnished with clean air supplied from either high or low pressure compressors.

Pedestal, swing-frame and portable grinding wheels, sprue and riser cutoff wheels, and chipping operations. This class of equipment has been especially troublesome when used on large and unwieldy castings, and supplementary respiratory protection is occasionally necessary. In this case the potentially dangerous dust is the sand adhering to ferrous castings that is removed or pulverized by the cleaning operation. The aluminum oxide or silicon carbide abrasives used in the wheels do not cause disabling pneumoconiosis, according to the best medical opinion at this time.

Specific suggestions for improving the foundry atmosphere and some considerations of the costs of such a program are covered in the second and concluding part of this article to be published in the next issue.—Ed.

Inert-Arc Welding With Direct Current

□ ○ ○

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□ ○ ○

DIRECT-CURRENT, straight polarity (electrode negative) can be used to advantage in Inert-Arc welding¹ most metals without flux, using either helium or argon gas. The common exceptions are aluminum and magnesium. For magnesium, reverse polarity can be used, and for thin aluminum, such as 0.025-in. and thinner, reverse polarity works well.

¹ See also *THE IRON AGE*, Oct. 31, 1946.—*Ed.*

Standard dc arcwelders of suitable current range may be used with the electrode holder connected to one terminal and the work connected to the other terminal of the generator.

Either helium or argon can be used. Helium should be standard ratio Bureau of Mines helium, procurable through welding gas supply concerns, or direct from the Bureau of Mines. Argon gas should be 99.8 ratio argon welding gas, and may be obtained from welding gas suppliers.

Two-stage regulators should always be used; they give a steadier flow of gas than single-stage types. Flowmeters should be calibrated for either helium or argon, whichever is in use. Flowmeters calibrated for oxygen, oxyhelium mixture, or other gases, will not give reliable readings of gas flow when used on argon or helium. Therapy-type regulators, in which the flowmeter is incorporated as a part of the unit, are suitable.

If the electrode holder does not have a gas shut-off valve in the handle, it is desirable to install a shut-off valve actuated by a hook on which the electrode holder may be hung when not in use.

Both air-cooled and water-cooled electrode holders are used for Inert-Arc welding. Air-cooled holders are particularly desirable for work involving currents up to 80 or 90 amp because of their light weight, small size, and simplicity. Generally speaking, this means that air-cooled electrode holders can be used for metal thicknesses of 1/16 in. and less except where particularly high welding speeds and consequently high currents are involved.

Water-cooled manual electrode holders are available with current capacity up to 300 amp continuous on straight polarity, or 120 amp reverse polarity. See fig. 1.

Centerless ground tungsten electrodes of high quality should be used for Inert-Arc welding. While other tungsten finishes can be used, the accurate diameter and clean surface of the centerless ground type are desirable in view of the very high currents which must be carried into the tungsten by the collet.

Carbon electrodes have been used for Inert-Arc welding, but they have the disadvantage of short life and are easily broken. When a tungsten electrode diameter is properly chosen, the carbon electrode will have little, if any, advantage over it in ease of striking and concentration of arc. The smallest tungsten electrode that can be used without dripping molten tungsten into the pool should be selected.

In normal operation, the ends of tungsten electrodes up to 3/16 in. diam should show a well-shaped ball. Larger electrodes will have a rounded end, and in all sizes the electrode should operate with a film of molten tungsten on the surface at the arcing end. The purpose in running the tungsten very hot is to stabilize the arc so that it will not weave from side to side, but will be directed straight from the tungsten to the work.

The current that will give this operation will depend somewhat on the design of the electrode holder and the skill of the operator, as well as on the polarity. Suggested current ranges for various electrode sizes using both straight polarity and reverse polarity are shown in table 1.

As shown by this tabulation, much higher currents can be used on given tungsten sizes with straight polarity than with reverse. This is because the positive end of the arc generates much more heat than the negative. When the tungsten is positive (reverse polarity), it runs much hotter than when it is negative.

Except when reverse polarity is used (on mag-

Since its introduction a short time ago, Inert-Arc welding is rapidly increasing in popularity, particularly for stainless steel, copper, aluminum and magnesium. How to apply this technique to these various materials is described herein, with information as to recommended amperage and welding speed, helium consumption and electrode size. The type of gas, welding generator, electrode holder, electrode and other equipment best suited to the process is also described

nesium or very thin aluminum), an arc length of approximately $\frac{1}{8}$ in. should be used. On reverse polarity, the arc length should be about $\frac{1}{16}$ in. With argon gas, straight polarity, the arc length is much less critical than with helium. A slight variation of arc length in argon does not produce objectionable changes in the penetration on thin stock, as may be the case with helium.

Joint Preparation

Joints should be clean and free from grease and oil. No flux is needed for Inert-Arc welding. Any ordinary joint design, such as fillet, lap, edge, corner, or butt, may be welded in any position. In general, work should be positioned for flat or downhand welding for greater speed and convenience. An exception is the corner joint, where greater speed and excellent contour can be had by welding vertically downward. It is desirable to use joint designs which do not require the addition of filler metal wherever practical.

Backing will improve the uniformity, appearance, and contour of the weld. Metal backing bars are usually grooved to a depth of about one plate thickness, and a width about three or four times the depth. Where metal backing bars cannot be used, argon, helium, or hydrogen gas backing will help to control penetration, and keep a bright, clean, undersurface.

Whenever hydrogen is introduced into a virtually closed container, provision must be made to ignite the hydrogen and provide sufficient air to permit its burning inside the container without forming an explosive mixture.

Any tacking which is done on work to be Inert-Arc welded should be done by the Inert-Arc process. If other processes are used, there is a likelihood of entrapping flux or other impurities which will upset the smooth flow of molten metal.

For machine welding, where filler wire can be added by motor-driven feed rolls, it is desirable to use small diameter wire, such as $\frac{1}{16}$ in., and feed it continuously at the proper rate to give the buildup required. With manual welding, larger filler rods similar to those used in gas welding can be used, with an intermittent addition of the filler. The filler rod should be placed into the edge of the molten pool as shown in fig. 2, and quickly withdrawn to prevent melting off



FIG. 1—Setup for Inert-Arc welding includes a standard air-cooled electrode holder, a dc arc-welder, and a bottle of helium with regulator, gas flowmeter and hose.



FIG. 2—Electrode holder is inclined slightly away from the direction of travel, and filler rod is added by alternately inserting and withdrawing it from the molten pool.

a large quantity of filler metal, which will result in a lump in the bead.

With either manual or machine feeding of filler rod, the rod should be kept almost flat against the work surface, so that it is not unduly heated outside the zone of protective gas.

TABLE I
Current Ranges for Various Electrode Sizes When Inert-Arc Welding

Diameter of Tungsten Rod	Amperes Straight Polarity	Amperes Reverse Polarity
0.040 in.....	Up to 110	10 to 15
1/16 in.....	90 to 180	15 to 20
3/32 in.....	100 to 250	20 to 40
1/8 in.....	200 to 380	30 to 60
5/32 in.....	280 to 450	40 to 80
3/16 in.....	300 to 600	60 to 100
1/4 in.....	500 to 800	80 to 130

TABLE II
Manual Welding Conditions for Butt Joints Stainless Steel—Helium—Straight Polarity

Thickness, in.	Electrode, Diam.	Approx Gas Flow, cu ft per hr Helium	Amp.	Travel Speed IPM
0.020	0.040	15 - 20	20 - 30	4 - 10
1/32	0.040	15 - 20	40 - 50	15 - 20
1/16	0.040	15 - 20	80 - 100	20 - 25
3/32	1/16	20 - 25	120 - 140	20 - 25
1/8	1/16	20 - 25	150 - 180	6 - 12
5/32	3/32	25 - 30	180 - 200	6 - 10
3/16	3/32	25 - 30	200 - 225	4 - 6

NOTE: For material 0.030 in. thick and thinner, the proper welding currents with helium will be so low that starting the arc may be difficult. Argon gas is preferable for this work because it requires about 75 pct more current than helium, and the arc can be struck more easily. It also has the advantage of being less sensitive to arc length and therefore is usable where the arc length cannot be as closely controlled as is necessary with helium.

Stainless steel is one of the easiest metals to weld with the Inert-Arc process. Table II gives a rough guide to electrode size, gas, flow, welding current, and travel speed in manual Inert-Arc welding with helium, of various thicknesses of stainless in butt joints, backed with a grooved copper bar. The welding speed obtainable on the job will depend to a large extent on the skill of the operator and the type of joint.

In machine welding, where the arc can be traversed mechanically and the proper arc length maintained either by automatic arc voltage control or by accurate jigging, much higher speeds can be obtained. On 0.050-in. stainless butt joints, with gas backing, speeds of 40 to 45 ipm can be used, with excellent bead contour, top and bottom.

The general comments and suggested operating conditions given under stainless steel will apply also in the welding of Inconel.

Copper welds better with the Inert-Arc than with other fusion welding processes. Where it is desired to keep porosity to a minimum, deoxidized copper stock should be used. In any event, deoxidized copper filler rods should be used where pure copper is welded, in order to reduce porosity. See fig. 3.

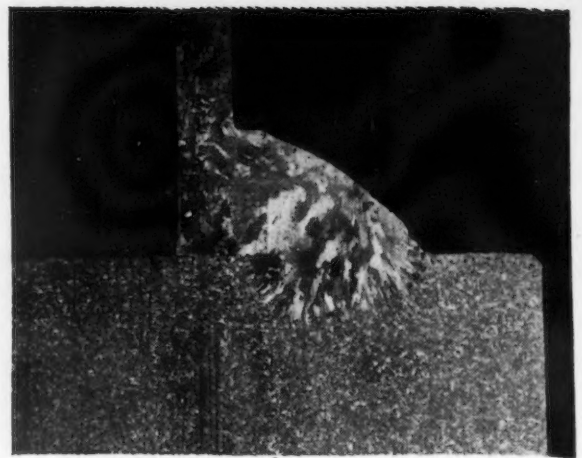


FIG. 3—Inert-Arc weld made in electrolytic copper. Deoxidized copper wire was used for filler, and work was done with straight polarity dc at 100 amp in a helium atmosphere.

It is difficult to give suggested operating conditions because these will vary over a considerable range, particularly if preheat is used. The major objective should be to use as high welding current as possible, and to preheat where practical, in order to accomplish the welding in the shortest time. The faster the weld is made, the less porosity it will have. Welds can be made in copper butt joints without preheat as shown in table III, using 1/8-in. diam deoxidized copper filler rod and a 3/32 in. diam tungsten electrode with approximately 25 cu ft per hr helium flow. Copper-silicon alloys are very easy to weld at speeds somewhat faster than pure copper.

TABLE III
Recommended Speeds and Current for Various Thicknesses of Copper

Thickness	Amp.	Speeds, IPM
1/16 in.....	60	12
1/8 in.....	110	10
3/16 in.....	160	10

Use reverse polarity with a short arc for magnesium. Welding speeds, current values, and helium flow are comparable with those used in welding stainless steel, but the electrode diameter must be increased to take care of the increased heating due to reverse polarity.

Aluminum can be welded with straight polarity only if flux is used. Without flux, the aluminum melts, but the surfaces are not clean, and will not run together to form a weld. Since the major advantage in the use of Inert-Arc welding is the elimination of flux, very little work on aluminum with straight polarity is done. Alternating current supplied by specially stabilized circuits, with argon gas, permits welding aluminum without flux and is preferable.

For very thin aluminum, such as 0.030 in. and under, reverse polarity can be used to advantage, since the low currents required permit the use of 0.040-in. or 1/16-in. tungsten electrodes, and do not produce wildness in the arc, if a very short arc length can be held.

FOR SALE . . .

Greater Output per Dollar

By L. D. McDONALD

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Turning in a real operating profit under today's conditions requires a new approach to the handling of depreciation reserves and fixed asset accounts. This article explains why it is vital that management establish a realistic outlook on its assets and depreciation reserves and establish a replacement and modernization program which takes advantage of modern engineering developments.

EXECUTIVES in modern business are becoming increasingly aware of two major problems:

The problem of making a real profit under today's operating conditions;

The problem of conserving the assets of the businesses for which they are responsible.

Both of these problems are very closely related, and in considering them, most financial men are too prone to look only at totals expressed in dollars, rather than at the physical value of the things which those dollars represent.

A property account representing machine tools should be valued in the minds of management not from the standpoint of the dollars which are used to represent this asset on the balance sheet, but from the value of the machines themselves, as measured by their ability to produce as effi-

ciently as any other machine in the plant of a competitor.

The machine tool assets of any company are not so many dollars; they are planers, boring mills, drills, radial drills, turret lathes, which are only of value as they produce goods to satisfy needs. You cannot cut metal with dollars, nor can you produce a profit with dollars in a manufacturing plant.

Too many financial executives are inclined to take asset accounts and depreciation reserves at face value, as current financial facts, whereas they are actually nothing but a history of what was done as much as 20 years ago, with some dollars the corporation invested in machine tool facilities. Instead, these men should be looking ahead to see what profits would be available by the replacement of old machine tools with modern, high-production machines.

When any factory executive is faced with the problem of getting out production, he thinks in terms of the physical equipment capable of doing the job, and should not be impeded in the attainment of his objective by a historical frame of mind on the part of a financial officer.

Fixed assets accounts and depreciation reserves are no more fixed than any other asset of a business. With a proper attitude of mind, actual current values can be expressed in these accounts; and they may serve as a real measure of the ability of a given plant to produce.

What is meant by "proper attitude of mind"? It can be put this way:

- (1) A determination to regard fixed assets and depreciation reserves realistically, in the light of obsolescence and shop performance under competitive conditions.
- (2) A replacement program which lends real meaning to book values and permits depreciation allowances more nearly in line with modern requirements.

Without such point of view, profits earned in theory may in fact prove merely to be a dissipation of assets, which brings us immediately into problem No. 2, the conservation of the assets of a business.

As previously noted, fixed assets accounts representing machine tools, and the applicable depreciation reserves, are nothing but a historical record of the past; and their measurement of the value to the company of the machines which they represent, in terms of ability to machine metal, may often be entirely fictitious, particularly in a competitive market.

Recovery of Capital Asset Costs

These accounts should represent the most modern and most efficient machines and methods for doing a job. They can do so only if the most modern and most efficient machine tools are represented by the dollars in the account.

This becomes self-evident when you inquire of most manufacturing concerns whether or not their depreciation reserves have been funded. It will be found that very few companies actually set aside the cash represented by their depreciation reserves; and for the most part, no reference is made to the depreciation reserve before a new machine tool replaces an old one.

Remember, the very theory of a depreciation reserve is that it represents the *recovery* of the cost of a capital asset. It does not take into consideration the dollars that may be required to *replace* that asset, nor does it take into consideration the loss of profit arising from the operation of that asset when a more productive unit is available. It does not take into consideration the fact that when the entire cost of an asset has been recovered through depreciation, a similar asset cannot be purchased for the amount of money represented by the reserve.

Machine tool design does not stand still, and, by and large, machine tool prices follow the course of the curve of productivity of the machine which is being sold. If any manufacturer depended upon replacing a given machine at the end of its useful life with a similar machine, he would find that he not only did not have enough depreciation dollars to buy the replacement machine, but that he had been operating the machine at a considerable sacrifice over much of its life, because of advances in productivity and design in the meantime.

American industry must recognize the necessity for spending more than ever before to keep its productive capacity intact and up to date; for not only has mechanical equipment become much more productive and consequently much more costly, but in addition, high wages, high material costs, and high taxes have been reflected in the machine tool industry, the same as in any other industry.

The manufacturer who is today charging into cost either no depreciation, because of fully amortized assets, or a very little depreciation because of what he thought was a bargain purchase—a used machine—will wake up some day to find that he has been dissipating the very asset which he has supposed he was conserving.

If his prices are reduced to reflect merely historical depreciation, he is not making provision for the replacement of the asset at higher prices; and if his prices have not been reduced, he is patting himself on the back for achieving a high profit when actually he is handing over to the tax collector 38 pct of the asset that should be preserved!

The fact is that in many cases profits as reported today, profits upon which income taxes are paid, are substantially higher than actual realized profits, in the light of failure to retain sufficient depreciation reserves. The tragedy of it is that many companies who are in this situation are themselves not even aware of it.

In the last analysis, in a competitive market, the price of any article will be determined by the most efficient producer. The manufacturer who closes his eyes to this fact is inviting financial disaster in the long run.

One of the greatest liabilities in American business today is the machine which is completely written off and still in operation. The company making money by operating such a machine is in fact paying in taxes to Uncle Sam money which it should be retaining in the business for replacement purposes. Unless a company actually does replace old machine tools by new ones, there is no way under our present tax laws whereby it can retain, out of earnings, enough tax-free income even to make a proper start for such purposes.

Make-Believe Profits

The two problems cited at the beginning of this discussion can now be joined together—the problem of making a real profit under today's conditions, and the problem of conserving the assets of the business.

We come to the inevitable conclusion that, from a long-term standpoint, conserving the capital assets of a business is essential to the preservation of a profit; and we arrive then at the crux of the whole matter—namely, that *the hesitation upon the part of financial men to approve expenditures that would transform hypothetical book values into actual operating values is today, in many cases, resulting in the reporting of make-believe profits which consist in fact of dissipation of assets.*

The profit possibilities of tomorrow do not depend upon where or how, or under what circumstances, people bought machine tools in past years. The profit possibilities of tomorrow are keyed directly into tomorrow's competitive position in the light of wages, prices, taxes, and all of the other factors which every company has to face at this moment.

By way of illustration, consider the case of four different companies, all engaged in the same general type of manufacture. Let it be assumed

that each one of these companies requires in its operations a certain standard type of machine tool.

Company A, let us say, now owns no machine tool of this type and is considering what it ought to do in this matter in view of the situation among its competitors.

Company B, let us assume, bought one of these machine tools in 1932, and under the old 20-year depreciation policy, this machine tool stands today on its books at a valuation of 25 pct of original cost.

Company C owns a machine tool of the same type that was bought at the start of the war, and under war amortization provisions this machine tool has already been entirely written off.

Company D, let us say, bought a machine tool of this type out of the War Assets Administration surplus, and has paid therefore a quarter of the original purchase price.

Out of these four companies, which one is going to set the pace on the basis of competitive price and performance?

The answer is, the first one that steps out and buys the very latest new and improved model, which will give it not only greater output per dollar, but will enable it to set up a higher depreciation schedule against future replacement.

While in any one company there may be spe-

cial circumstances which make the above generality inapplicable, on an average overall basis, the very financial men who hesitate to approve modernization expenditures will find, if they put their slide rules to work, that those companies that have spent the most money for modernization, keeping their depreciation schedules higher by so doing, have been the ones that have stepped out front in price competition, in volume of sales, and in consistency of earnings.

That is why the Machine Tool Show, to be held at the Dodge Chicago plant Sept. 17 to 26, is of particular importance to financial executives. At this exposition there will be on display hundreds of different products designed for one single purpose—to insure greater output per dollar.

There are about 220 different types of machine tools made in the United States. There are many varieties of each type and combinations of these types. All this will be on display. It is a concentration of modern engineering in the art of cutting metal, centered upon the objective of more goods for more people at lower cost.

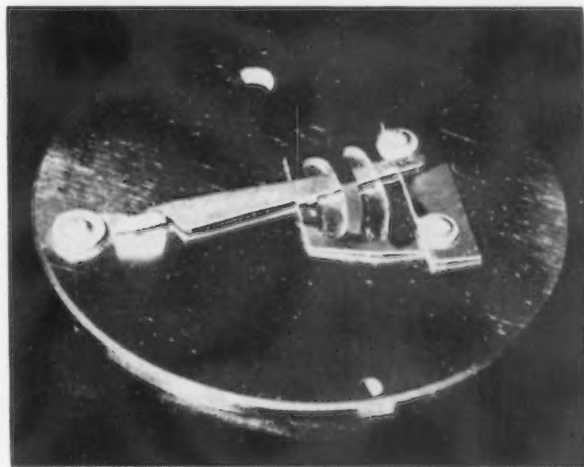
No manufacturing executive, no banker, no person charged with the efficient operation or conservation of manufacturing facilities, can afford to disregard this opportunity to appraise the facts behind the figures on the balance sheets of American business.

Small Scratch-Recording Strain Gage

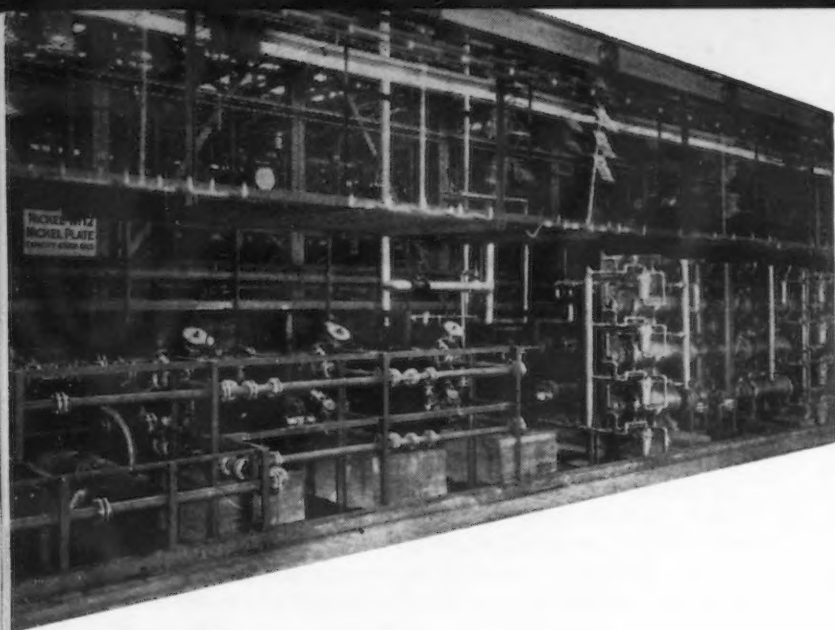
SAID to be the smallest and lightest recording strain gage devised, principal applications of the deForest scratch-recording strain gage shown in the accompanying illustration are listed as the measurement of strains in fast-moving machine parts such as airplane propellers and engine crankshafts. The gage has also been used to some extent on stationary structural members. This instrument weighs less than 2 g and is designed to record deformations of 0.0001 to 0.050 in. by a scratch record pattern on a small polished chrome-plated target. This scratch record may be examined and measured under a filar eye-piece microscope of about 100 to 250 magnification, or photographs of up to 1500X may be made.

The scratch record is made by a special abrasive coating on the end of a 2-in. arm which is held on the target with the gage fastened to the structural member under test by screws, solder, spot welds, or clamps. Attachment is made with the scratch arm parallel to the direction of strain. Deformation of the member causes longitudinal movements of the scratch arm and target relative to each other while the arm gradually sweeps across the target. Although the gage does not measure torsional strain quantitatively it indicates its presence and frequency in terms

of longitudinal vibration. This gage which was not available during the war was formerly sold through Baldwin Locomotive Works, Philadelphia 42, and the company has now acquired manufacturing control of the product.



BENDING strains in a disk being measured by means of the de Forest scratch recording strain gage.



VIEW of a section of the new Pontiac Motor Car Co. automatic plating line showing arrangement for constantly filtering the solutions for maintaining bath temperature by use of heat exchangers. This plating line is said to be the largest in the world.

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Plating Problems Discussed At AES Annual Meeting

A wide variety of the fundamental and practical problems of the electroplater was covered in papers presented at the 34th annual convention of the American Electroplaters' Society, held recently in Detroit. Abstracts of papers read at the meeting covering solution purification, bulk nickel plating, disposal of plating room wastes, barrel chromium plating and bright brass plating of diecastings, are given in this article.

ELECTROPLATING solution purification was the subject of a paper presented by B. C. Case, Hanson-Van Winkle-Munning Co., Matawan, N. J. This paper was the winner of the AES Hermione Dorothea Proctor Award. Various designs of continuous electrolytic purification systems were described; also removal rates of copper, zinc and iron from nickel solutions.

A search through the early literature will reveal all the information necessary to use electrolytic purification methods on nickel plating solutions, according to the author. In spite of the existence of this evidence, however, low current density purification methods were not used by the plating industry until about 10 years ago.

About the time that bright nickel plating solutions made their appearance, the plating industry was found with little practical working knowledge of the effect of impurities or the efficiency

of the various suggested methods of purification. The platers had a choice of the following methods that worked fairly well in the laboratory: First, chemical precipitation with or without adjustment of the pH; second, electrochemical precipitation; third, chlorination; fourth, oxidation by hydrogen peroxide, sodium perborate or potassium permanganate; fifth, occlusion of impurities by precipitates. Combinations of these methods were sometimes used.

Some time later the use of activated carbon was recommended for the removal of organic impurities in nickel plating solutions. There soon came a classification of impurities into two groups, metallic and organic. With this division of their effects and methods for removal, the present trend of thought in purification methods became firmly established. By using electrolytic purification to remove metallic impurities and activated carbon with or without other activated materials to remove organic impurities, the operation of bright nickel plating baths became considerably better stabilized.

Most platers have seen nickel deposits from plating baths containing excessive metallic contamination. The most common defect caused by metallic impurities is a loss of color or darkening of the nickel deposit in the low current density recesses. Black streaks, black pits or gray deposits in all current density ranges are other noticeable effects of foreign metals. Loss of ductility of the deposits is most noticeable with iron.

By using a cathode having symmetrical variations in recesses and high points and using an

overall current density of 5 amp per sq ft the proper current density requirements for all four common metallic impurities, copper, zinc, iron and lead, can be satisfied. Practice has shown that the ordinary corrugated black iron sheets are one of the most satisfactory types of cathodes for this method of purification, involving all four metals named. When an overall current density of 5 amp per sq ft is applied to this corrugated type of cathode, the copper and lead deposit out in the recessed areas and the zinc and iron will deposit out on the high points. Under these conditions all four metals will plate out simultaneously with nickel.

The progress of the purification treatment can be judged by the observation of the deposit on the dummy cathodes. When black or dark deposits have disappeared and the color or brightness approaches that obtained at normal current densities from a clean bath, it can be assumed that the impurities have been reduced to a good operating level. Summing up, when the maximum area of the properly shaped cathodes is used with proper agitation and current density, rapid purification from metallic impurities in a nickel plating bath can be expected.

While nickel plating solutions have been used for this illustration, electrolytic purification can be successfully applied to other plating baths. It is in successful use on practically all copper baths either alkaline or acid, and cyanide zinc and cadmium baths bear out this statement. In most cases the current density is the only variable to be adjusted. A large advantage of using the electrolytic method for removing metallic impurities is that the plating bath does not have to be transferred to a storage tank for treatment. In fact the electrolytic method is impractical to use except in the plating tank. Judged from all angles, this method properly applied, is the easiest, cheapest and fastest process for removing metallic impurities.

Considering organic materials, it is found that the mechanics of removing organics from nickel solutions by activated carbon are not understood as completely as the removal of metallic impurities. While activated carbon is not the easiest material to handle around a plating room and to filter from solutions, equipment and techniques have been improved until it no longer remains a major worry.

One of the first warnings about the use of activated carbon or other adsorbing materials is "Never add the carbon directly to the plating tank." The reasons are obvious, but occasionally

platers do just that. A suitable storage and treating tank is mandatory.

Solution agitation should accompany the addition of the carbon. To prevent the dry carbon from getting into other plating baths or blowing around the plating room, it is usually advisable to make a slurry of the carbon in a small container before it is added to the plating bath. After the carbon is in the plating solution, 1 to 3 hr should elapse, during which time the temperature is controlled and agitation continued.

It was a logical step from batch purification to continuous purification methods wherever feasible. Numerous designs for continuous purification tanks have been developed and used with existing equipment or in conjunction with new equipment. The deposits from bright nickel solutions that are subject to continuous purification are much more consistent in quality on a week-to-week basis because impurities never rise to a point that would affect adversely their physical characteristics.

Copper, zinc, lead and iron, in any combination can be removed by electrolytic means from nickel plating solutions. The batch or continuous methods as outlined are applicable to practically every nickel solution now operating. While costs will vary somewhat between types of nickel solutions, the benefits gained are uniform. Applications of electrolytic purification need not be limited to nickel solutions only.

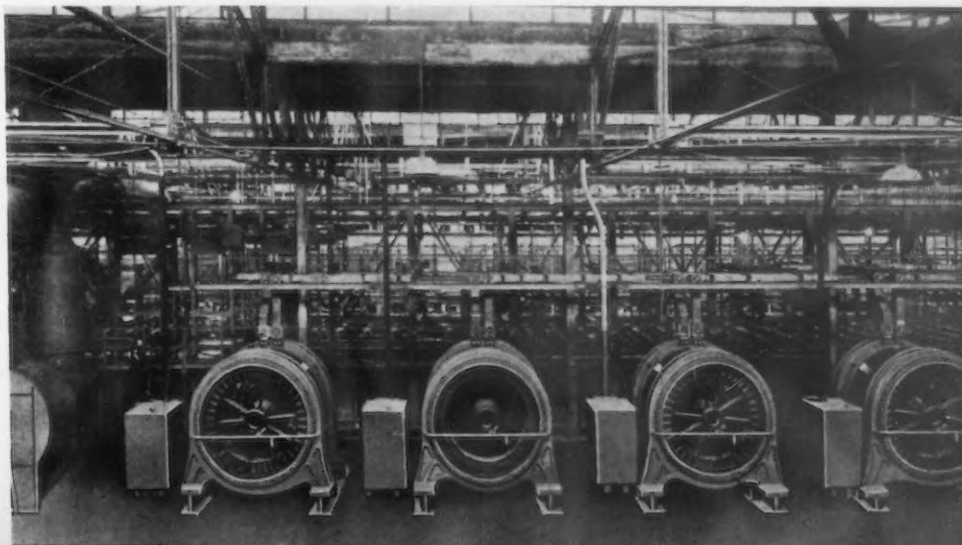
In the case of organic impurities, the application of the continuous carbon treatment is not as broad as the electrolytic method of removing metallic contaminants. However, all bright nickel plating solutions should have periodic carbon treatment wherever continuous treatment is not advisable. In this case, also, carbon treatment need not be restricted to nickel plating solutions alone. The wise choice of well-engineered equipment will allow the application of these purification treatments more broadly with gratifying results.

Bulk Nickel Plating

DESCRIBED in a paper on bulk nickel plating by Henry Strow, MacDermid, Inc., Waterbury, Conn., were two general types of solutions developed for bulk or barrel plating nickel. One of these is designed for general purpose work and can be used almost universally regardless of equipment. This type will be designated as the high sulfate solution. Brighteners are available which give excellent results with very good

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CURRENT for the plating operations on the new Pontiac line is obtained from 22 Chandeysson motor generator sets, four of which are shown here. These generators are capable of supplying a total of 285,000 amp and vary in size from 5000 amp at 6 v to 15,000 amp at 12 v.



throwing power. Parts plated in this solution can be chrome plated without difficulty.

The other solution, an innovation in nickel barrel plating, contains a large amount of nickel chloride and uses organic brighteners. While equipment must be of proper specifications because of the corrosiveness of the solution, the solution has a high tolerance for impurities and is very well suited to heavy plates.

For conductivity, additions of magnesium sulfate were used because of its negligible effect on ductility and other plating characteristics.

The high sulfate solution is of the Watts type,

World's Largest Plating Plant

A FULLY automatic plating plant, 660 ft long and 50 ft wide, said to be the largest individual plating plant ever installed, has been completed at the plant of Pontiac Motor Car Co., Detroit. Engineered and installed by the George L. Nankervis Co., Detroit, the entire installation was completed in 11 months. The plating machines, built by Meaker Mfg. Co., embrace three sections—copper, nickel and chrome. A description of the features of this installation was published in *THE IRON AGE*, June 5, 1947, p. 92. Illustrations accompanying this report cover some of the highlights of this unusual installation.

with the addition of magnesium sulfate to improve conductivity. Many variations are possible but the following formulas are typical and illustrate the range of application.

Where 6 to 8 v are to be used at room temperature to slightly above, the following formula gives good results:

- Nickel sulfate, 24 oz per gal
- Nickel chloride, 6 to 7 oz per gal
- Boric acid, 4 oz per gal
- Magnesium sulfate, 24 to 32 oz per gal
- Brightener, 6 fluid oz per 100 gal

When 12 v are available and the maximum in performance is required, the following solution is recommended:

- Nickel sulfate, 32 to 40 oz per gal
- Nickel chloride, 8 to 10 oz per gal
- Boric acid, 5 oz per gal
- Magnesium sulfate, 24 to 32 oz per gal
- Temperature, 120 to 130°F

With 12 v on the power supply, this solution will draw up to 400 amp in a conventional plating barrel of normal size.

These solutions may be operated at room temperature, but give better results at temperatures from 110° to 130°F. The pH of best operation is usually from 5.2 to 5.6, though good operation may be secured over a wider range both above and below the specified range.

The high chloride type of nickel plating solution holds good possibilities for bulk plating. However, in the equipment for this plating solution there must be no metal under the solution exposed to the solution except the cathode contacts. Lead linings and heating coils are definite-

ly taboo and nonmetallic linings and heating coils must be used. All materials used in barrel construction should be of a type approved for bright nickel.

The solution formula used is approximately as follows:

- Nickel sulfate, 20 to 25 oz per gal
- Nickel chloride, 20 to 25 oz per gal
- Boric acid, 5 oz per gal
- Organic brighteners
- Temperature, 120° to 130°F
- pH, 4.5 to 5.0

Nickel chloride has very high conductivity, over twice that of the nickel sulfate, thus permitting very high amperages, equal to or exceeding the high sulfate solution. The solution is extremely insensitive to metallic contamination and changes in operating conditions. The plate takes a chromium deposit very satisfactorily. While slightly harder than other bulk nickel plating, it is extremely adherent and does not flake or peel even when plated to a thousandth of an inch.

Bright Brass Plating Of Zinc Diecastings

THE conventional method of brass plating leaves much to be desired from the standpoint of current density and efficiency. Generally 45 or more minutes are required to obtain a deposit of sufficient thickness to buff. The method described in this paper on bright brass plating of diecastings by Stanley J. Beyer, Hart Mfg. Co., Hartford, uses the properties of modern plating solutions to obtain a brilliant, bright yellow brass color on zinc base diecastings.

The process is adaptable for use on all base materials and provides the following advantages:

- (1) The final finish is equal to or, in most instances, superior to the appearance of the most highly buffed and colored brass;
- (2) the plating cycle can be completed in 15 min or less;
- (3) no final buffing of brass is required on buffed base metals;
- (4) the method is based on a copper-nickel-brass system similar to the conventional copper-nickel-chromium system, and
- (5) the covering power of the brass solution over bright nickel is excellent.

The procedures, as they are presently used in production, including cleaning, copper and nickel plating, brass coloring and control of the brass bath, are described in this paper.

The polished and buffed castings are degreased, if necessary, in a trichlorethylene vapor degreaser to remove excess buffing compounds. The parts are then given a 30 sec cathodic alkaline cleaning in a 3 to 6 oz per gal solution of trisodium phosphate at 180°F, or equivalent cleaning with a proprietary cleaner for zinc base diecastings in accordance with the manufacturer's recommendations. The castings are rinsed, given a quick dip in 1 pct muriatic (hydrochloric) acid and rinsed again.

The castings are struck in a standard copper cyanide strike solution, then copper plated for approximately 5 min at 30 to 50 amp per sq ft in either a high efficiency cyanide copper or a Rochelle salt copper plating solution. After cop-

per plating, the parts are rinsed and cleaned in a diecast alkaline cleaning solution, if required, to remove wetting agents used in the copper bath. Then the castings are acid dipped (10 pct sulphuric acid), rinsed and bright nickel plated for from 5 to 10 min at 30 to 50 amp per sq ft to obtain a high luster.

With the copper and nickel plating thus accomplished, and after rinsing, they are given a 20 to 50 sec flash of brass, acquiring a brilliant yellow brass color, free from any buffing lines. The castings are then rinsed, dried and suitably lacquered.

Care should be taken not to allow the bright nickeled castings to dry before brass flash or the nickel will become passive. Should the brass deposit be off-color, it may be flashed again, or nickel plated and flashed again, after the solution has been corrected. Another alternative is to remove the brass by treating the castings anodically for a few seconds in a cold cyanide stripping solution of the following composition:

12 oz per gal NaCN
2 oz per gal NaOH

If properly deposited, the nickel will remain bright and receptive to a new brass deposit.

Although a conventional brass bath is suitable, some revisions of the composition more nearly fit the problems at hand. The following conditions are recommended (bright yellow color is practically assured):

6 v may be applied directly without a rheostat
pH: 11.5 to 12.0 (pH papers are satisfactory)
Free cyanide: 2.0 to 2.5 oz per gal
7.5 cc per gal of NH_4OH (28 pct NH_3)
Temperature: 70° to 80°F
Anodes: half 18-8 corrosion resistant steel;
half 70-30 brass

The addition to the brass bath of a wetting and brightening agent similar to that used in high efficiency copper cyanide baths, in approximately one half the concentration used in copper, will aid in keeping the brass deposit bright. Care should be taken not to prolong the deposition at high current density because a burned, off-color deposit will result.

Barrel Chromium Plating

G. DUBPERNELL and S. M. Martin, United Chromium, Inc., New York, presented a paper on barrel chromium plating. The chromium plating of small parts has always been a problem. Basket chromium plating is widely practiced with considerable success, but the parts have to be inspected for burning or lack of coverage, and the method is mainly applicable to round parts such as screws. Flat parts tend to shield each other or nest together, and are difficult to basket chromium plate. A special machine was patented for chromium plating balls.

An automatic barrel was built in 1933-34. It was operated successfully for a number of years and large quantities of parts were chromium plated in it for such firms as the Chase Brass & Copper Co. and Scovill Mfg. Co. A voltage of about 10 to 12 v and current of 400 to 500 amp were generally used, and the output was about 30 lb per hr. This machine ultimately became a

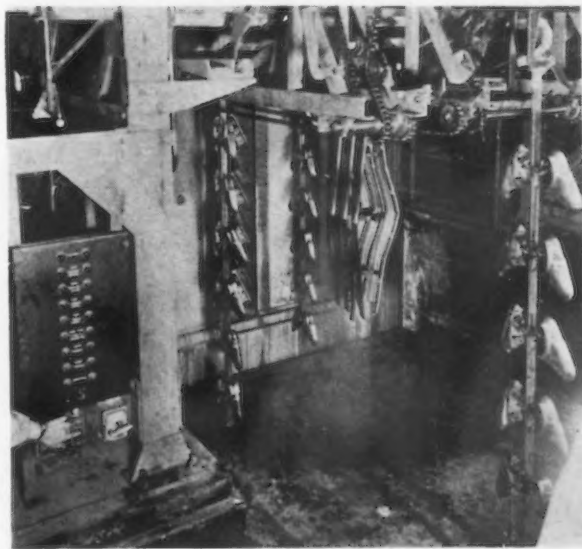
victim of the depression of the 1930s, and was not successfully marketed because it was difficult to justify at that time, the more than \$2000 which it cost. A small laboratory version of the same barrel, but of the batch rather than continuous type, was constructed. It had a capacity of 6 gal with the same 16 in cylinder diam as the larger production barrel, but a cylinder length of only a single track, about 3 in. Many solution variations were tested with this laboratory barrel and the silico-fluoride bath was adopted for general use.

The barrel as presently used is essentially an enlargement of this laboratory unit, with the cylinder lengthened to 10 in. The tank has a capacity of about 70 gal of solution.

To date, barrel chromium plating is confined to the plating of a thin layer of work only, and the parts cannot be heaped up in a thick layer or mass, as in barrel plating or bulk plating with nickel, copper, zinc, or cadmium. With the chromium plating operations described here, the term barrel plating very properly applies, but it does not necessarily mean large production volume plating such as comes to mind when one speaks of barrel nickel or cadmium plating. The distinction is that barrel chromium plating is adapted or recommended for parts which cannot be otherwise chromium plated economically, if at all; for example, extremely small parts or parts of such shapes as are not adapted to racking, wiring, or basket plating. The work should preferably be nickel plated prior to barrel chromium plating, to a thickness of at least 0.0001 to 0.0002 in.

A plating time for chromium of 10 min is generally used, and this gives an average thickness of bright chromium plate of about 0.000005 to

(CONTINUED ON PAGE 134)



A MASTER panel at the starting end of the copper section of the Pontiac line. A panel of this type is located at the starting end of each of the machines. If the machine is stopped for any reason, a trouble light on the panel indicates the source of the trouble. The machine cannot be restarted again until the light is off and a warning horn has sounded for at least 30 sec.

Redesign Increases Mill M

CAREFUL redesign of mechanical and electrical components, especially of the armature, bearings and bearing housings, and field coils, has made it possible to produce a line of mill motors with the ratings reduced one frame size (see table I). There is no change in the mounting dimensions or shaft extension for a given frame size. A new type 100 hp 550 v motor is shown in fig. 1. A comparison of ratings of existing and proposed mill type motors is given in tables II and III.

The higher rating is made possible by a larger and more efficient armature that fits within the limiting dimensions. The greater armature length is made possible through the use of semi-self-contained roller bearings. In addition to the bearing being shorter, its ability to take end thrust eliminates the need of a rotating steel collar on the shaft and a bronze thrust collar in the bearing housing. Thus, the new bearing housing being shorter than the old one saves considerable space.

The larger diameter of the new armature is achieved by an improved arrangement of the field coils. Four commutating poles are used in place of two. These require fewer turns and result in more space available for the main field coils as can be seen in fig. 2. Armature coil conductors are impregnated with silicone varnish.

Armature coils are held in the slot with wedges of class B material instead of bands (see fig. 2). This makes for easier winding as each slot can be finally closed as soon as the top half of the coil is placed in position.

The commutator is held together by bolts. It fits directly onto the shaft. The mica V-rings extend around the corners of the bars on the inner diameter for it is this point that is vulnerable to grounds. Liberal wearing depth is provided in the section of the commutator bars and ex-

traordinary length of the neck is provided where the coil is attached to the bar. This makes possible many refacings of the commutator while at the same time leaving ample contact area between the coil ends and the bars.

The new roller bearing and its special housing eliminates the need for thrust washers and collars. As a result, the bearing center is some 2 in. further out on the shaft extension, reducing the stress on the shaft considerably. A seal holds the grease in the housing and should grease leak past the seal, a passage way to an overflow sump precludes the possibility of its getting inside the motor.

The bearing housing design incorporates a flange at each end that forms a pilot fit between the housing and the frame. The housing is clamped into position in two ways: (1) by four auxiliary bar clamps on the lower frame half that fit into hold-down notches on each side of the bearing housing, and (2) by the upper half of the frame when closed and bolted to the lower half. The auxiliary clamps preclude the need of having to rebuild and rebore the frame fit because a small steel burr or other foreign object got between the housing and frame during repair and later when assembled caused undue wear. Should this ever happen, all that is necessary is to tighten the auxiliary clamps to bring the housing firmly against the frame fit.

Design of the bearing housing provides for the cap on the inside of the roller bearings and the housings on the outside. This means that the entire housing, together with the outer race and rollers, can be pulled away from the armature without disassembling the bearing housing. Should a bearing fail, it is possible to remove the housing and leave the bearing and inner cap on the shaft. Pulling jaws can then be applied to the bearing to remove it.

Cast steel is used for the frame. It is split above the centerline to permit bolting the commutating poles on a horizontal centerline of the motor. The upper frame half can be removed without disturbing either the poles or main field coils.

Rigid mounting for brush-holders is achieved by welding machined blocks to the frame. Brush-holders are offset to stagger brushes on the commutator to prevent grooving. Two brush arms are used on all sizes up to and including the 610 frame; four are used on the larger sizes. Cast brass is used for the brush-holders. A porcelain insulating bushing is mounted over a micarta tube that fits on the brush-holder supporting pins. The micarta tube is protected from dam-

TABLE I
Comparison of Sizes of Bearings in Old and New Line

HP	New Frame	Bearing	Old Frame	Bearing
5	2	309	2	309
7½	602	310	3	309
10	603	311	4	311
15	604	313	6	313
25	606	316	8	316
35	608	317	10	317
50	610	319	12	319
75	612	321	14	322
100	614	323	16	322
150	616	326	18	326
200	618	328	....	....

Motor Ratings

By C. B. HATHAWAY

Manager, D-C Motor Engineering, Motor Div.,
Westinghouse Electric Corp.,
Buffalo

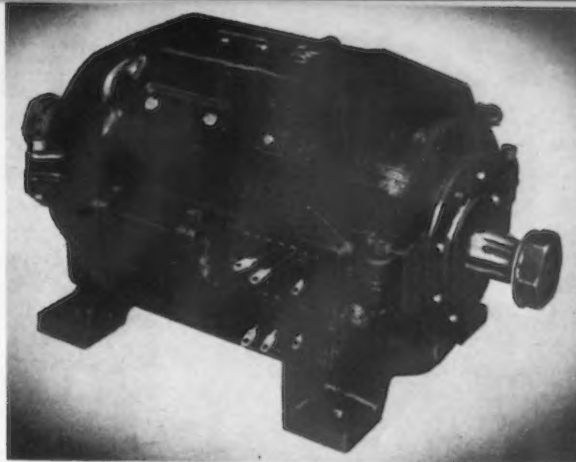
age by the clamping blocks by a brass thimble.

The mounting arrangement for the four brush-holders is such that part of the lower frame half directly below the commutator can be used to bring air into the motor for force ventilation. An exhaust post is arranged at the pinion end of the motor.

Conductors of the commutating and series field coils have drilled copper terminals brazed to them. Since all connections between frame halves are brought to the outside of the motor frame before being made, the upper half of the motor frame can be removed without disturbing any connections inside the motor.

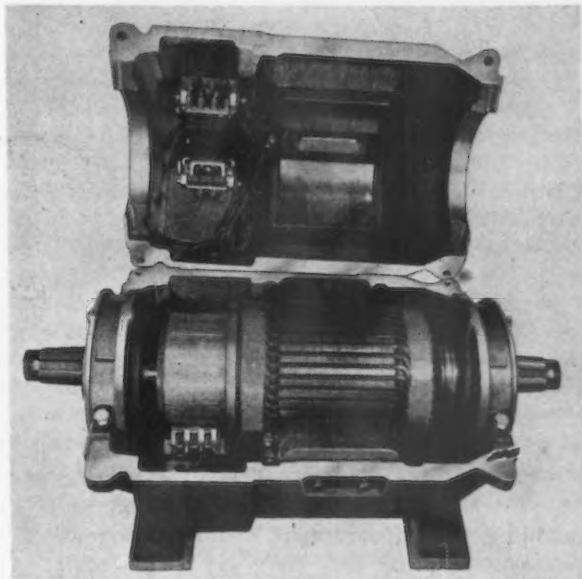
The redesigned main field coils still use the familiar steel shell construction. To assure better insulated properties, the new coils are first wound on a mold with turns separated by asbestos paper and then taped with mica and glass tape. Before impregnation, the coil is assembled over the steel shell. The steel washer is placed on top of the coil and tack welded in several spots. A sheet of asbestos paper protects the glass tape against damage from the heat of the weld. The entire coil assembly is then vacuum and pressure impregnated in thermoset varnish.

The new motor is expected to find ready acceptance on existing installations where an old motor is overloaded. It can be put in exactly the same place as the old one for the mounting holes and shaft extension are the same. If the old



TOP

FIG. 1—Typical of the redesigned line of mill motors is this 100 hp, 550 v, 460 rpm motor in a No. 14 frame.



ABOVE

FIG. 2—Mill motor with upper half of frame opening, showing brush-holder mounting, main field pole and commutating pole mounting, bearing housing mounting and armature and commutator contactors.

motor is overloaded, then its speed will be slower than intended. The increased capacity of the replacement motor will cause the speed to come up to that needed.

TABLE II

Comparison of Frame Size of Existing and Proposed Mill Type Motors

1-Hr Rating		Frame Number	
HP	RPM	Present AISE Standard	Proposed AISE Standard
5	900	2	2
7½	800	3	602
10	725	4	603
15	650	6	604
25	575	8	606
35	525	10	608
50	500	12	610
75	475	14	612
100	460	16	614
150	450	18	616
200	425	....	618

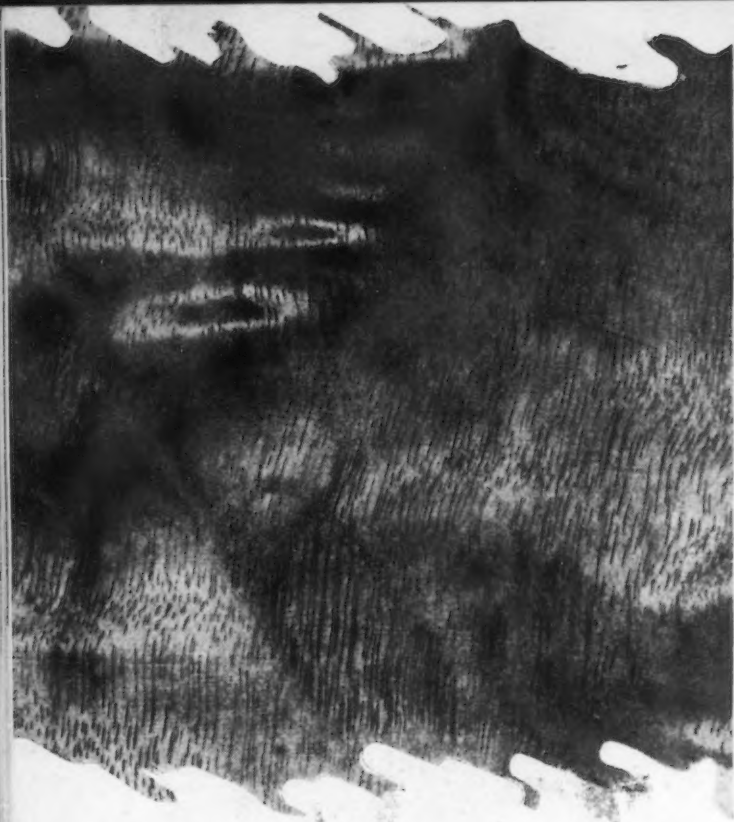
TABLE III

Comparison of Ratings of Existing and Proposed Mill Type Motors

Frame Number Present AISE Standard	Existing HP 1-hr Rating	Proposed HP 1-hr Rating	Increase, pct
2	5	7½	50
3	7½	10	33½
4	10	15	50
6	15	25	66½
8	25	35	40
10	35	50	43
12	50	75	50
14	75	100	33½
16	100	150	50
18	150	200	33½

Offset Machines Pr

By HERBERT CHASE



AN interesting and rather unusual metal finishing operation is the application of a wood grain finish to such metal parts as moldings and instrument panel components for passenger cars.

This becomes apparent upon examination of the methods used in plants of Fisher Body, Ternstedt Div., General Motors Corp. The plant at Trenton, N. J., where garnish moldings and some related products, such as glove compartment doors, are produced for assembly into Chevrolet, Oldsmobile and Pontiac cars in other plants, for example, does a remarkably fine and efficient job in this type of product. Some of the methods employed in this plant are described in this article.

As the fabrication of the parts from sheet and strip steel, though highly efficient, is fairly conventional, it need not be dealt with in detail. It may be said, however, that all steel used has, as purchased, as good a surface as is available commercially today and that the sheet and strip used is stress relieved in leveling rolls that also improve surface smoothness and help to remove minor imperfections, such as crow's feet. The stress relief also facilitates the drawing operations which have much to do with the smoothness of surfaces that later receive applied finishes.

Products, such as window frames, three of which are illustrated in fig. 1, are drawn in two pieces and are flash welded. Both frames shown at top in fig. 1 are metal trim beads. Only the flat panel is grained on the frame in the foreground, the remainder being in a solid color. The glove door has a diecast and plated trim strip with two painted stripes, but the remaining surface of the door itself is grained. To insure proper smoothness at the welds, in fabricating these parts, much care must be used in flash removal. This is done by belt sanding in Udymatic machines, fig. 2, equipped with special holders

and cams that rock the frames as the sanding proceeds and, at the same time, shift the belts with their driving units in such a way that the surfaces at the welds are not only smoothed but have a minimum of metal removed. There is a grinding unit, including a narrow abrasive belt and its driving motor, at each station and each such unit is raised and lowered so that the belt follows the contour of the section being polished as the frame is rocked up and down about the pivot of the holding fixture. Some grinding units are also given transverse motion in the plane of the belt. This has the same effect as if the work were oscillated sidewise, as it would be if held by hand by an expert polisher.

Machines of this type are operated in pairs by three men. Each machine has eight positions around the table and, at each, as the table is indexed, the pieces are rocked once up and down under the corresponding grinding belt. Indexing is automatic as are all motions except loading and unloading the frames.

Work is brought to one machine of each pair by an overhead chain conveyer. The first operator removes the frame from the conveyer and sets it into the fixture as the machine pauses at the indexed position. Thereafter, the piece is not touched by hand until it reaches the unloading station. There, it is unloaded by the second operator who immediately shifts the piece and places it in a fixture of the second machine, turning the frame so that the second weld of the piece is brought into proper position to have this weld ground as the piece is indexed around the second machine.

At the unloading station of the second machine, the third operator removes the piece, which then has both welds ground, and hangs the frame on the chain conveyer.

In addition to the large pieces, such as a com-

Produce Wood Grain on Steel

Producing a simulated wood grain finish on steel parts for automobiles in the Fisher Body Trenton, N. J., plant involves some unusual equipment and finishing procedures. The wood graining procedure and equipment used at the Fisher plant, as well as the savings resulting from the substitution of this finish for the decals previously used, are discussed herein.

plete frame for a window opening or a half frame for a windshield, there are many smaller moldings and glove compartment doors which, instead of being handled separately through all finishing processes, are racked for most of these, so that they can be processed several at a time. The labor of racking and unracking is offset by economies in other handling and in securing the required results as to the finish applied. In all, some 75 different items are finished.

Production schedules vary between makes and models, hence the processing schedules have to vary to be kept in step with overall schedules of other GM plants making components, bodies and cars. For these reasons, although the plant is tooled to make certain standard Fisher body components, each line has some degree of flexibility, and finishing lines must be changed, as to colors and graining applied and in other minor respects, to meet the overall schedule requirements.

There are two complete and parallel finishing lines, each operated more or less independently of the other but, as conditions and schedules vary, there are some interchanges between the two lines although both are operated simultaneously and as nearly as possible, at full capacity.

Except for a little stripping on plated diecastings, which do not go through the main finishing lines, all parts handled are steel and most of these come direct from forming or drawing operations with some oil on the surfaces to be painted, but otherwise not very dirty. This makes it possible to confine major cleaning to degreasing in trichloroethylene. As a preliminary to degreasing, however, the parts, delivered by chain conveyer in bulk, ten or more to a hook, are shifted to another chain holding one piece per hook. On the way to the degreaser, the parts pass an inspection station where defective ones are removed.

Passage through the degreaser

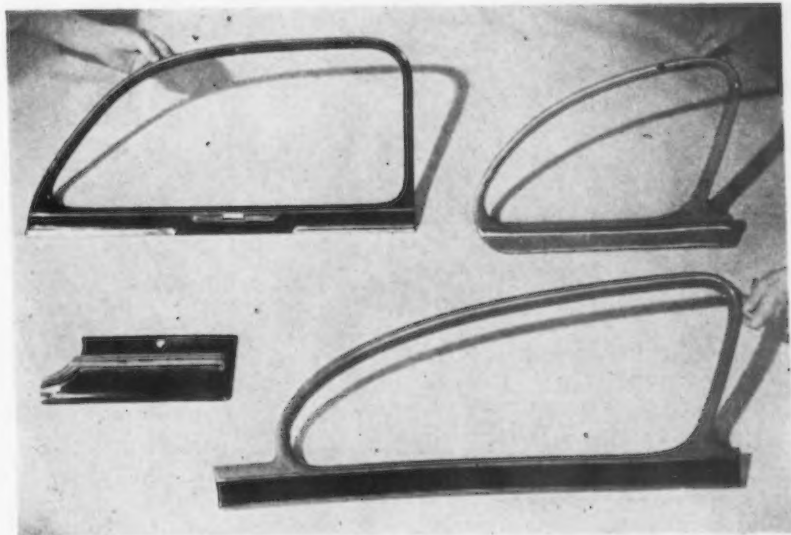
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IG. 1—Metal automobile window frames and a glove door showing various wood grain finishes.

on the chain requires 12 min during which the parts are heated to nearly 150°F, the maximum temperature of the solvent. In this passage, the parts travel first through vapor only, then through a spray designed to remove dirt particles mechanically as well as by solvent action, and finally through a second vapor chamber designed to remove the last trace of oil. When parts emerge from the degreaser, which is equipped for continuous filtration and redistillation of the solvent, parts make a long circuit on the chain to cool to room temperature before dipping.

As parts near the dip station, they are quickly handwiped to remove any traces of smut that degreasing may have left. To each piece there is also applied a special hook with a spring element that fastens under the bent-back outer edges of the C-shape section. This hook bears at points that are hidden in service and is necessary because, if parts were supported by an ordinary hook, the hook would produce a flaw in the finish where it contacts the face exposed in service. Several types of hooks are needed for parts of different sectional shape but, as a rule, only one or two types of parts are run through the degreaser during a shift.

Dipping is done, as shown in fig. 3, by two men, each of whom handles two pieces at a time. The dip tank is at the end of a line served by a bar conveyer which, after the pieces have drained



and most solvent has evaporated, carries the work through the baking oven.

After each pair of parts is dipped by hand, the parts are hung, by the attached hooks, on a bar conveyer by the operators who do the dipping. Within a few seconds thereafter, during which draining proceeds, the parts reach a station where operators, each holding a slender 2-ft tube, blow drops of paint out of holes and off the pieces. This prevents formation of sags by paint that, except for this blowing off with compressed air, would remain in each hole.

Dipping is done in a ground coat of synthetic or oil-base type designed to coat all surfaces of every piece. On most parts, the coating thus applied is the only one required on surfaces that remain hidden in service and provides these surfaces with sufficient protection against rust. Surfaces that remain exposed in service receive, besides the ground coat, graining and lacquer coats, as later described.

The dip coat serves as a semigloss ground for the later applications and, in addition, has much to do with the appearance of the graining, for it is designed to show through between the areas that are covered subsequently with darker color graining ink, thereby producing, with the graining, so close a simulation of wood that only closest inspection can reveal a difference.

Draining of the ground coat and evaporation of the solvent proceeds after the blowoff as the work is advanced through a short chamber from which a blower draws off all fumes. This greatly reduces the formation of fumes in the baking, which follows immediately, and also keeps the exhausted fumes out of the oven, reducing, to that extent, any fire hazard during the bake. Paint that drains from the dipped parts runs to a sump and is pumped back into the dip tank.

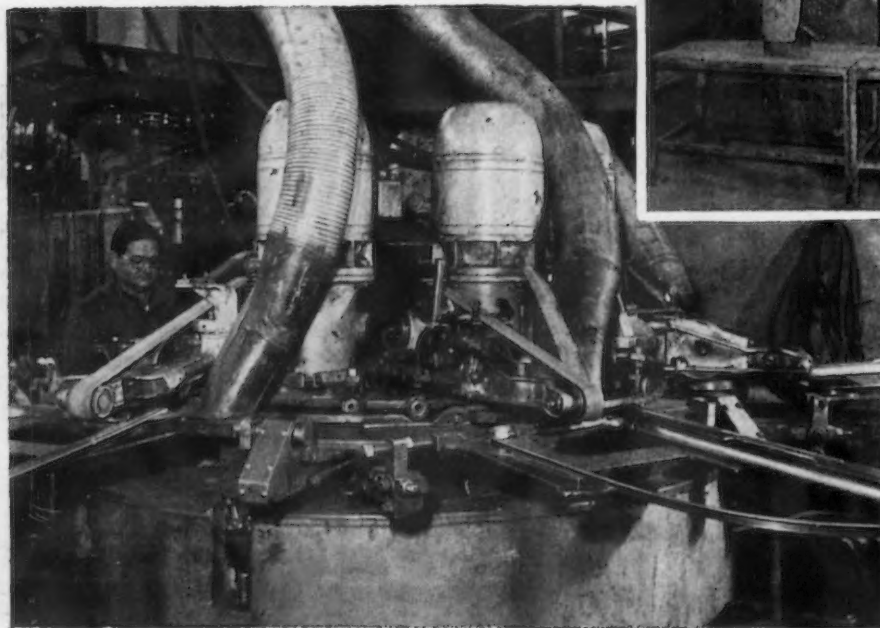
Although a mechanical dipping setup has been considered to replace hand dipping, it lacks the flexibility of hand dipping, and is subject to possible delays, if it fails to function as required. Also, larger tanks and longer cleanup time are involved when a color change is required, as it is fairly often with present schedules. It is ex-

pected, however, that an automatic blowoff setup will replace the hand-operated one now in use.

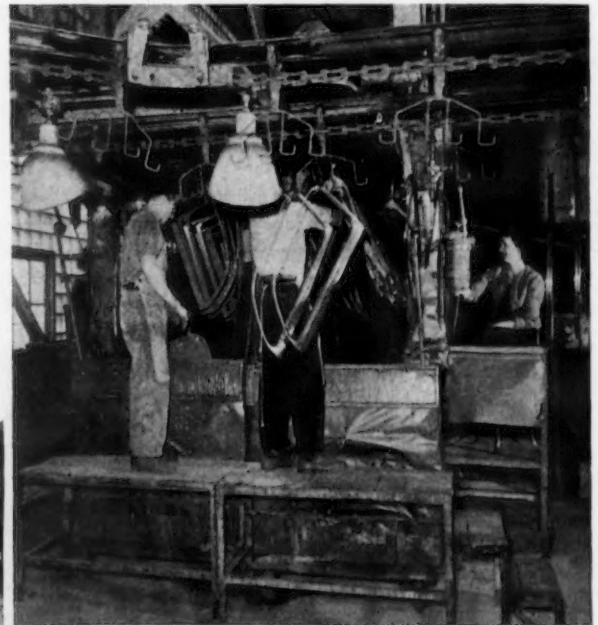
Baking is done in a Mahler oven equipped with air circulation and oil-fired burners for indirect heating. It requires about 3 min for parts to reach the 375°F baking temperature, 14 min at this temperature and 8 min cooling to exit temperature or, including the time for evaporation of solvent before entering the oven, a total of 27 min after blowoff. When parts emerge from the oven, they are hung again on a chain conveyer which advances them to the lines where graining is done and, subsequently, through other finishing, to assembly and packing lines.

Application of graining is done in much the same way as offset printing except that rolls rather than a rubber blanket are used. Some of the rolls are of gelatine and some are of synthetic rubber. The latter are distorted while in use to accommodate their surface to curved metal surfaces. Machines are not like printing presses but are adapted to the type of material and shape of piece that is to be printed. Also, the ink is somewhat special and includes some tack varnish. As the surface printed (unlike paper) is non-absorbing, baking for rapid drying is done.

To distribute the ink properly to the soft rolls which, in turn, transfer the ink to the ground coated surfaces to be grained, it is necessary to employ a photo-engraved steel sleeve or cylinder, which carries the design of the particular wood



82—THE IRON AGE, August 21, 1947



ABOVE

FIG. 3—Degreased parts are lifted from the conveyer and dipped in the ground coat tanks. The girl blows paint out of holes.

o o o

LEFT

FIG. 2—Abrasive belt grinder in which weld flash on frames is removed. The frame is automatically rocked up and down and some belts have a transverse motion.

FIG. 4—A graining machine which permits application of the grain to curved surfaces.

grain to be reproduced. After engraving, done by an outside supplier, the cylinder is first copper plated and then hard-chrome plated to give it wear resisting properties. Chrome plating commonly lasts about 16 hr and then is stripped down to the copper which is again replated.

Ink is pumped onto the metal cylinder as it rotates in contact with the soft printing cylinder and the ink that adheres to the high spots of the engraving is transferred to the soft cylinder against which the metal cylinder rolls. Immediately thereafter, the soft cylinder rolls in contact with the ground coated steel surface and transfers the design to this surface, as desired.

Where graining is to be done on a flat surface, the soft cylinder need not be distorted except for such slight deflection as rolling under a light pressure involves. But where, as with window frames, the surface has considerable curvature and the roll must pass around an inner contour having somewhat the shape of the letter D, the cylinder has to be considerably distorted to maintain rolling contact with the ground coating. This is accomplished by using a soft synthetic rubber cylinder of 2½ in. diam, which is hollow at one end and providing, inside the hollow portion, a roller which deforms the cylinder wall as it passes between the inner roller and the work. The amount of distortion is varied by mounting the inner roll on the end of a lever which is displaced the required amount by a pedal that the operator depresses as needed, while the garnish frame moves and is pressed against the outer surface of the soft roll.

Most window frames have, at the lower side, a relatively flat panel that is grained first in a machine that uses a 6-in. vertical cylinder. The frames are merely passed between the soft printing roll and a pressure roll along a straight track after having been lifted from a chain conveyer.

Handling is done by two girls and a third girl wipes off any excess ink deposited outside the area to be covered in this operation and then lays the frame on a belt conveyer which advances it along a line passing several other graining machines. These have inclined tables and are equipped with the small deflecting type of roll used to coat the curved surfaces inside the frame, as shown in fig. 4.

Girls operating these machines take frames from the conveyer one at a time and pass them through their respective machines. As the rolls turn about fixed axes, the frame moves between the pressure roll and the printing roll and, in so doing, slides around the supporting table near



the center of which the printing rolls are placed. This results in printing the remainder of the surface to be grained on the frame.

Although there may not be exact registration between the printing on the flat panel and that on the curved areas, this is scarcely detectable and any noticeable defects are touched up by inspectors along the belt, who use fine brushes that effectively mask or correct any slight irregularities. At the end of the belt conveyer, frames are removed by hand and are placed on racks for traverse along a track in front of a spray booth.

As the frames move along this track, edges are sprayed, using small guns and shading varnish. The latter contains some pigment and covers edges that have not been printed, hiding the ground coat thereon so that the edge blends with the grained surface though actually not grained itself. These edges are commonly partly or completely hidden with trim braid when the body is assembled but, where exposed, must not leave the ground coat uncovered, as a light line then is in evidence. Shading varnish is very quickly applied and, at the end of the booth, the completely grained frames are hung on a bar conveyer for movement through a baking oven. This traverse requires 20 min and baking is done at 375°F in the same type of oven previously used.

The third type of graining machine, fig. 5, is one used on glove compartment doors and graining has to match with that done, in another plant, on instrument panels against which the door fits. These doors have a curved surface that, until recently, could not be grained satisfactorily on any machine available. In consequence, the front face was covered by a paper decal purchased ready printed with the design required thereon.

To apply the decal on a curved surface would have proved difficult; hence it was applied to flat steel blanks, before forming, and then was sent to the forming department for the several forming and assembly operations necessary to make a glove door. As was natural in handling through dies, the paper was often injured and



FIG. 5—Curved glove compartment doors are given a grain finish in this machine, after the girl at the left lightly sands the ground coat. The printing rolls are visible in the center of the photograph.

rejects often ran to 35 pct, wasting this proportion of decals besides necessitating stripping for salvage and refinishing operation.

Efforts to eliminate such losses led to the development of the graining machine shown in fig. 5. This machine makes use of a soft vertical cylindrical printing roller above which is mounted, for doors having a curved edge, a second roller having a deflecting lip similar to that for window frames. As a result, decals are now eliminated, along with nearly all rejects and the same number of girls grain more than twice as many pieces an hour as for the decal application; hence there is a large saving in labor as well as in the cost of decals and of salvage operations on the doors that formerly were rejected because the decals were injured in processing.

With this machine, the ground coated doors are first lightly hand sanded with fine sandpaper to remove any dust particles baked into the ground coat or adhering to it. Then a second girl mounts the doors on wooden fixtures which are set on edge in a track by a third girl. A latch, which is advanced in timed relation with the printing cylinders, pushes the fixture, with the door in contact with the printing roll, between the latter and a pressure roll, thus transferring the design to the door.

Another operator then removes the door from the fixture, lays the latter on a belt, which returns it to the loading position, and places the door on a rack holding four doors. When the rack is filled, it is hung on the conveyer and is carried through the baking oven.

The fourth type of graining machine is more like a printing press than any of the others, as it uses two large horizontal (20x20 in.) cylinders, one of which has an engraved plate fastened around its outer diameter. Below the soft printing roll is a track for a conveyer which advances racks of flat parts under the printing roll. The racks, supported on a carrier, hold several flat strips or other flat parts that are grained as the printing pass is made. Racks are then sent, still loaded, through the drying oven.

When printed parts emerge from the drying

oven, the ink is dry but does not have high adhesion. To protect it from abrasion and to give the work a good luster, it is taken from the bar conveyer, hung on a chain conveyer and, after cooling to room temperature, is carried through a booth where a coat of clear lacquer is sprayed over the grained surfaces.

A single lacquer coat is sufficient for parts not subject to abrasion but window frames, against which clothing rubs, are given a second coat. The latter covers the front as well as the back (which, of course, already has a ground coat) and helps to protect the unexposed surfaces against the more severe corrosive conditions that prevail around windows. Such frames withstand 100 hrs of salt spray without showing rust spots.

Some window frames have only the flat bottom panel grained, the remaining exposed surfaces being given a solid color by spraying on a pigmented enamel which, after drying, also receives the clear lacquer coat. Before lacquering, some panels also require that a stripe be applied in a recess provided for this purpose. Such panels are laid on a wire mesh belt and are striped with a gravity fed brush (a tube with an orifice at the end) and then continue along the belt below infra-red lamps which dry the stripe.

When two coats of lacquer are applied, there is a brief air dry between coats, as the parts pass on the chain to the second booth. All parts lacquered, whether with one or two coats, are baked for 10 min in an oven steam heated to 175°F and then are ready for packing or for any assembly work that may be required. The latter is done along three 160-ft conveyer belt lines beside which are the presses and other machines needed to complete the unit.

Assembly is done chiefly on window frames which require stainless steel trim strips, medallions, and metal backed pile-fabric strips that bear against glass surfaces to exclude drafts and moisture. Stainless steel trim strips have backing with tabs that extend through pierced holes provided for this purpose and that are bent over in presses equipped with the proper punches. Medallions are similarly applied.

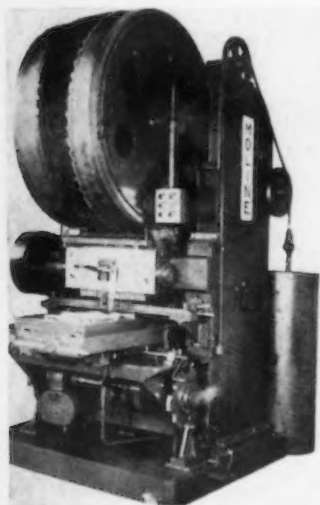
From this discussion it can be seen that the production and finishing of garnish moldings is a somewhat exacting job and that this job is performed on an efficient basis comparable to that for other somewhat similar but less specialized work. That fine appearance is also achieved is also apparent to anyone who notices interior details of the cars previously noted.

New Equipment . . .

Special header plate and double-end drilling machines, light duty lathes, an automatic power saw, spot welders and bench grinders are described herein. Included among other new developments are a brazing turntable, index tables, gear pumps, magnetic pulleys, wheel dressers, work loading equipment, all-petroleum cutting oil and a photoelectric control.

Multi-Spindle Drill

A SPECIAL 29-spindle machine for automatic drilling of aluminum header plates for head transfer equipment in aircraft has been developed by *Moline Tool Co.*, Moline, Ill. The machine is equipped with a method for automatic spindle selection, which is synchronized

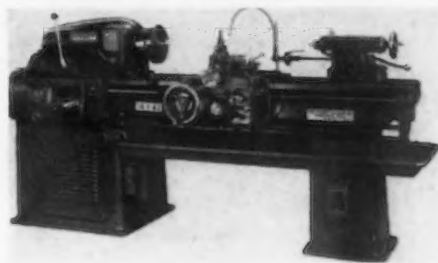


with the indexing of the work table. Spacing of the spindles is such that every third hole in a row is drilled at one pass of the drills and the table indexes twice to complete drilling of each row of holes. The spindle selector drum has no motion either vertically or horizontally, but is indexed so that it turns on its horizontal axis at each pass of the drills. The work table on which the pair of plates to be drilled is mounted is moved up and down by cam action to produce rapid traverse and feed. On the same slide with the table is mounted the rail which carries the drill spindles.

Light Duty Lathe

A 14-IN. general purpose light duty lathe designed by *Hendy Machine Co.*, Torrington, Conn., features remote controlled belt-

shifting arrangement with spindle speeds from 30 to 1142 rpm. The machine has 48 thread and feed changes and push button start and stop control. Lubrication is automatic. The spindle runs on pre-

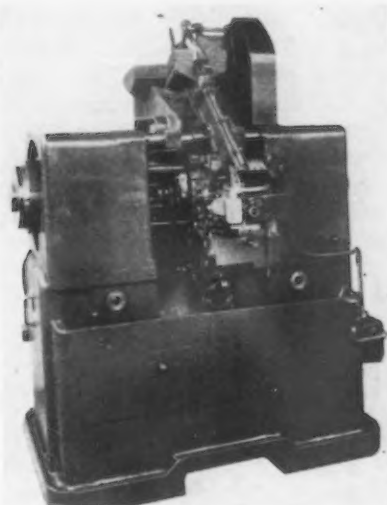


loaded super-precision, antifriction bearings and is mounted separately from the belt drive and driven through a geared clutch or back gears. Power is furnished by a single speed 5-hp ac motor which provides four initial high speeds. The headstock spindle is driven through a geared clutch by a 4-step cone pulley that is separately mounted so that belt tension has no effect on the spindle. The clutch is controlled by a lever at the front end of the headstock which engages and disengages the cone pulley. Enclosed in a separate housing which is attached to the headstock, are the feed gears and high-speed reverse.

Double-End Driller

ANNOUNCEMENT of a fully automatic double-end driller, known as the *Buhrmatic*, for production drilling of crossed holes, has been made by *Buhr Machine Tool Co.*, Ann Arbor, Mich. The machine is hopper-fed and drills, reams, countersinks and checks at desired angles by indexing the collets in an indexing turret, providing 8 work stations and a loading and unloading station. The machine can be operated in batteries of four by one operator; parts are loaded

in one bulk handling and ejected automatically. Safety devices stop the machine to prevent damage from broken tools. The original machine was developed to drill, ream and countersink two lacing holes in a 5/16-in. bolt and produced at the rate of 960 pieces per hr. New developments make it



adaptable for processing other parts within the chucking capacity of the machine, such as bushings, bearings or pins.

Hydraulic Press

FEATURING the motor mounted inside the column and rigidity to the extent that deflection is eliminated for practical purposes, a 6-ton hydraulic press has been introduced by *Acme Broach Corp.*, E. 3rd St., Lexington 47, Ky. The machine with a standard work table is suited to push broaching and assembly work. With the table removed an open space of 50 in. is provided between the top of the foot and the end of the ram when the ram is in its upper position. The machine functions as a horning press in this capacity. Special tables including types used for straighten-

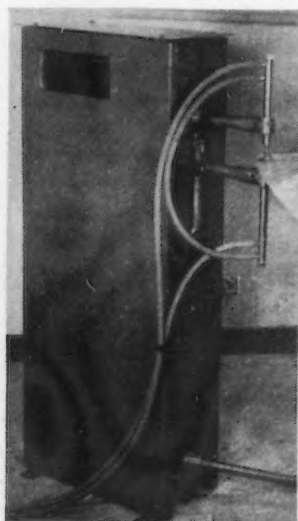
ing operations may be mounted. Control is by hand lever or foot pedal. Stroke of the machine can be set up to 24 in. max and is controlled by stop dogs. A heavy steel



cylinder honed to a high mirror finish is fitted centrally in the upper housing of the column. The ram is of the conventional hardened and ground type, the work end being tapped 2 in.—8P with a ground bore ahead of the thread in order to centralize any adapter screwed into the ram.

Spot Welder

THE 10 kva Taylor Hall spot welder made by the Federal Machine & Welder Co. has been an-

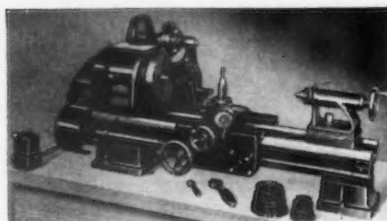


nounced by the DoAll Co., Des Plaines, Ill. This machine has an automatic electronic timing device and magnetic contactor built-in to provide better welds on production work even with unskilled operators, it is said. Other features are its

vertical plane action which gives true pressure, simplifies tip alignment and eliminates top skidding. A high power factor water-cooled transformer, adjustable horns and water-cooled electrode holders, adjustable stroke and treadle mechanism and a 6-tap voltage selector are also features of the welder. The machine connects to 220 v, 60 cycle power and 110 v, 60 cycle timer sources.

9-in. Lathe

OFFERING the same design features that characterize the larger lathes of this company's line, Logan Engineering Co., 4901 W. Lawrence Ave., Chicago 30, has introduced a 9-in. swing lathe with 18 in. between centers. The lathe is recommended for general machine shop, repair and toolroom work. Features include ball bearing spindle mounting with the 2 V



ways and 2 flat ways of the bed precision ground to within 0.0005-in. parallelism. Self-lubricating bronze bearings protect wear points and massive construction is said to insure steadiness on heavy cuts and durability.

Cutting Metal

A UNIVERSAL grade of cutting metal known as Willey's 606 for machining all types of steel has been placed on the market by Willey's Carbide Tool Co., 1340 W. Vernor Highway, Detroit 1. The metal is available in the form of standard tools, specials or blanks and can be used at low speeds with heavy feeds as well as for light finishing cuts.

Brazing Turntable

AN IMPROVED automatic turntable for continuous soldering, brazing and annealing of small ferrous and nonferrous parts has been developed by Lepel High Frequency Laboratories, Inc., 39 W. 60th St., New York 23. The table

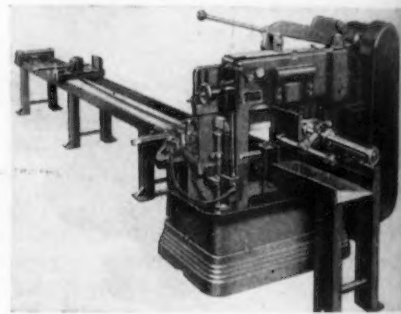
uses small cup-like receptacles in which the part to be treated is placed and which are said to simplify the positioning of the parts and to assure uniform heating. The automatic turntable operates from 115 v, 60-cycle supply source and is powered with a 1/4 hp motor.



Speed can be varied from 1/2 to 3 rpm to allow for a wide range of heating cycles. The receptacles automatically revolve as the part is being heated to assure uniform heat distribution. As many as 68 parts per min can be processed.

Automatic Power Saw

A 7x7-IN. power saw with mechanical pull-up and equipped with an automatic length gage for

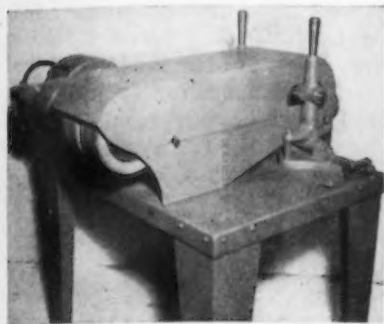


gaging lengths from 1/8 to 48 in. has been announced by Peerless Machine Co., Racine, Wis. Metal is fed forward through a four-sided saw frame which surrounds the metal to be cut instead of straddling over the work. To permit maximum pressure on the saw blade, without unduly shortening blade life, a special backing plate is provided to back up the blade.

Double Belt Bench Grinder

MODEL DBS double belt bench grinder has been added to the line of precision abrasive belt

grinders manufactured by *Porter-Cable Machine Co.*, Syracuse, N. Y. A heavy duty drive shaft mounts two 7-in. diam x 2½-in. wide resilient contact rolls located side by side a few inches apart. Each contact roll is aligned with an idler adjustable for abrasive belt tension, tracking and lining up with the



contact roll. This arrangement is said to provide for the use of 2 endless metal-cutting abrasive belts 2½ in. wide x 60 in. circumference, one of which can be fitted with a coarse abrasive belt for rough grinding and the other with a fine grit belt for finishing. The DBS equipped with a 1 hp motor is said to give the abrasive belt a cutting speed of 5200 sfpm. Accessory items available include an 8-in. diam contact roll, 29-in. high or 12-in. low leg assemblies and a wire brush attachment.

Index Tables

ELECTRIC powered geared and hand operated index tables are offered by *Buhr Machine Tool Co.*, Ann Arbor, Mich. These tables are available in seven sizes, from 10 to 48 in. diam. Power is transmitted through a worm and worm gear to a roller type cam track which is said to permit smooth, uniform, angular acceleration and deceleration and to



eliminate backlash, bumps, jars and vibration. The table load is carried on ball bearings in a hardened race and is centralized by a heavy ball bearing spindle. The index table can be adapted to operate in vertical or

horizontal plane. The operating motor can be placed at front or rear, depending upon table installation.

All-Petroleum Cutting Oil

LONGER tool life and improved finishes are claimed for a line of cutting oils manufactured by *Sun Oil Co.*, 1608 Walnut St., Philadelphia 3, which contain an ingredient known as Petrofac, made entirely from petroleum, eliminating the use of animal and vegetable fats. It is reported the ingredient cannot turn rancid and cannot support bacterial growth.

Gear Pumps

CALLED the Cub-line, a line of hydraulic gear pumps announced by *Hydro-Power, Inc.*, Springfield, Ohio, are designed for hydraulic applications in such fields as machine tools, construction and material handling machinery. Available in 10, 15 and 20 gpm capacities, the line is said to have an overall efficiency rating of 90-92 pct. The

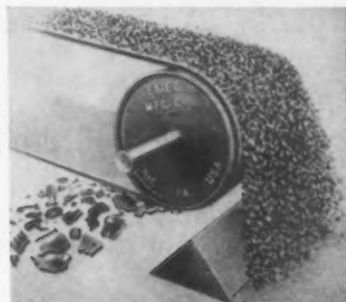


pumps are reversible and designed to operate equally efficiently in either direction. Floating bronze wear plates at either side of the gears divide clearance into 4 narrow slits, providing high fractional resistance to flow recirculation. A valve directs slippage oil past the shaft needle bearings for positive, continuous lubrication. Internal parts are machined to close tolerances; shafts are alloy steel; cases are cast from alloy iron. The pumps are dimensioned so that discharge can be piped at full flow from either front or side.

Magnetic Pulley

A SELF-ENERGIZED magnetic pulley requiring no electric current to generate a magnetic field is now in production at *Eriez Mfg. Co.*, Erie, Pa. The pulley is adapt-

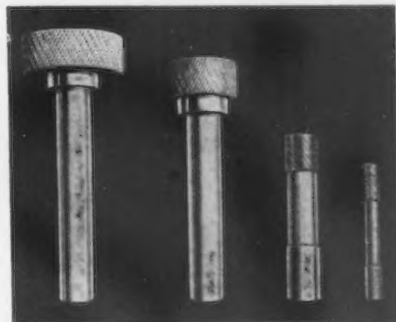
able to all applications requiring automatic separation of magnetic from nonmagnetic materials conveyed on a belt. In foundry mold shake-out machines the pulley removes iron fins, particles and gagers from the sand as it is elevated over the shake-out screen. Efficient separation of ferrous and



nonferrous borings and turnings in the metalworking industry is also reported. As no wiring is required, portable magnetic separation can be made at several points in a plant with the same unit. Powered by Alnico magnets, the pulley can be installed in locations which preclude the use of electrically powered magnetic separators due to severe temperature changes and unusual operating conditions.

Carbide Grinding Bur

DEVELOPED for internal grinding, jig grinding, and blending or fine finishing by off-hand grinding, a carbide grinding bur announced by *M. A. Ford Mfg. Co., Inc.*, 780 W. First St., Davenport, Iowa, is said to work on soft materials or on steels hardened to 65 Rc. This bur is precision ground



on special machines to produce a uniform and concentric tool for maximum cutting efficiency. It is said to hold hole shape and tolerances without dressing or setup adjustment. Ford carbide grinding

burs are stocked in standard sizes from 1/16 to 3/4-in. tool diam for operation in precision grinding equipment at conventional grinding speeds.

Wheel Dresser

THE radius and angle wheel dresser manufactured by *Matco Tool Co.*, 2834 W. Lake St., Chicago 12, is said to form concave or convex radii with any two angles tangent in one continuous motion without stopping. With the micro diamond adjuster, the diamond can be set to tenths for accuracy. The dresser features micrometer feed to the wheel for precision dressing. A special tip-back column



feature eliminates necessity of removal of dresser from the table. The dresser is available with a sub-base for T slot machines.

Grinding Coolant

WHEELYFE 85, a grinding coolant developed by *Bee Chemical Co.*, 63 E. Lake St., Chicago 1, is a clear solution which will not load the wheel, it is claimed, even with the finest grit sizes. Because of freedom from loading, the finish is said to be determined by the grit size used and is not the mirror finish obtained by the buffing action of a loaded wheel. This coolant is also said to sink chips well, give proper corrosion protection and does not become rancid.

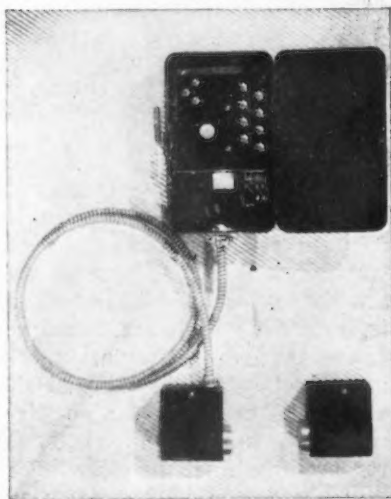
Work Loading Equipment

AUTOMATIC work loading equipment developed by *Seneca Falls Machine Co.*, Seneca Falls, N. Y., can be applied to single machines or to a battery of machines, according to the manufacturer. On a lathe on which both head and tailstocks revolve and

which is equipped with a rotary type loader, machine operation is said to be entirely automatic. In this application, valve guides which have been previously bored to size are placed in a loading chute and fed by gravity into openings in the rotary loader. The loader indexes the pieces to the proper position where they are automatically picked up by the continuously revolving spindles of both heads. The OD is rough and finish turned in the same operation by two separate carbide tools, each having its individual feed. The finish turning tool begins cutting after the roughing tool has been relieved from the work, thereby assuring close concentricity between bore and finished diameter. This rotary type loader is said to assure complete control over the pieces, thus eliminating danger to the operator and to the piece, which is completely stationary by the time it reaches the discharge tube.

Photoelectric Control

PHOTOELECTRIC control, Type 20DJ1 introduced by *Photo-switch, Inc.*, 77 Broadway, Cambridge 42, Mass., is a high-speed general purpose control designed for counting, conveyor control, automatic paint spraying, break detec-

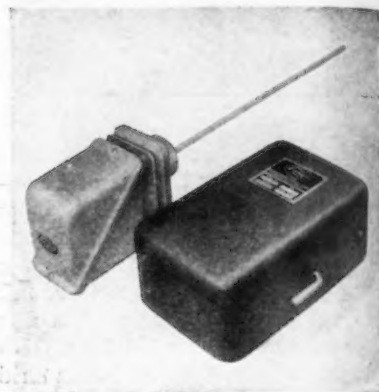


tion, automatic weighing, sorting, gate signals and other industrial processes. Phototube and light source lamp are in a dust-tight, die-cast housing and wired to the control housing. The control is designed to give unlimited life under conditions of high temperature and humidity. A tamper-proof sensitivity adjustment is provided on the control housing to permit positive

operation over varying distances from control to light source and under conditions of ambient light. The relay operates in 1/20 sec and the operating range is 10 ft.

Flame Failure Safeguard

INTRODUCTION of the latest Fireeye flame failure safeguard for industrial gas oven, kiln, and boiler protection has been made by the *Combustion Control Corp.*, 77 Broadway, Cambridge 42, Mass. Electronic flame rod type 45JQ1 is used with programming control type 24PJ8 for full automatic burners. It is used with control type



24QJ5 when only operating protection is required. Fireeye is said to be a foolproof electronic flame failure safeguard which maintains a constant vigil day and night. When flame fails it instantly cuts off fuel and can be wired to sound an alarm automatically. Fireeye responds to the flame itself, not to a secondary effect of the flame.

Wire Rope Hook Fitting

A WIRE rope hook-end fitting has been introduced by *Electroline Co.*, 4121 S. LaSalle St., Chicago 9, which is built as an integral part of the hook and wire rope ends on winches, cranes, hoists, derricks, draw works and similar equipment. The device, incorporating the Electroline Fiege Connector, is applied with common tools and is removable. The assembly may be checked through an inspection hole. A vibration damping effect is said to prolong the life of the wire rope and eliminate the need of frequent resocketing. The hook is forged steel and is available in stationary or swivel types for 10 wire rope sizes between 1/4 and 1 in.

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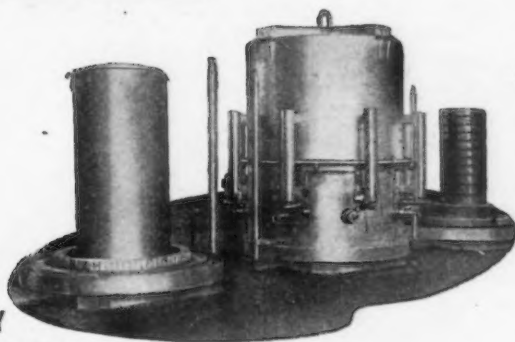
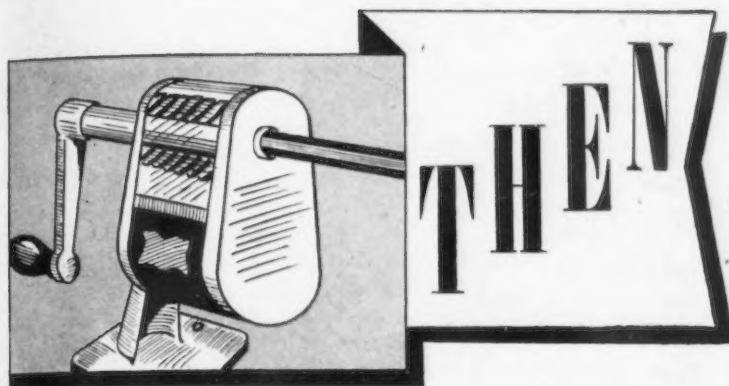
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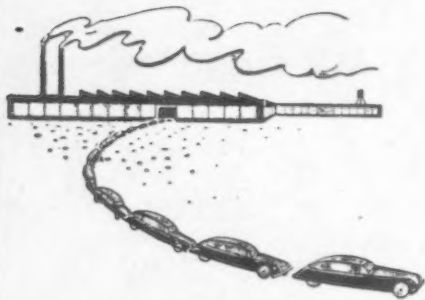
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WALTER G. PATTON

• Action at Packard is seen as end of Foremen's Assn. . . . It may not test new law . . . Ford production is still spotty . . . UAW adds three new demands.



DETROIT—Although not heralded or advertised by the automakers, last week saw a most significant development in the Foremen's Assn. of America's acknowledgment of defeat by 13 chapters of this once powerful union. The Ford Motor Co.'s victory over FAA in July in the 47-day strike was termed as the turning point, but when the FAA chapter of Packard Motor Co. tossed in the sponge some observers here declared the fate of the union was sealed.

Some of management's most bitter struggles during recent years, in the auto industry as well as others, has hinged on the question of organized unions at the foreman's level. The argument many times reached the Supreme Court of the land and the wording of the Wagner Act as well as its intention was challenged frequently by both union and management. Although the Taft-Hartley Act specifically relieved employers of any obligation to bargain with foremen, the issue has not yet been taken into the higher courts. In fact it now appears that the independent foreman's union will acquiesce without first testing the legality of the new labor law.

Robert H. Keys, former foreman at Ford, who first organized the FAA from a social club into a recognized foremen's union, accused

the Packard chapter of selling out to the company. Keys' blast followed the withdrawal of the Packard chapter and the resignation of its president, Prosper Traen. Keys went further and accused the company of "taking advantage of the demoralization of spirit brought about by the Taft-Hartley Law." The president of FAA said Packard officials had offered union members a 10 pct wage increase "and other elaborate promises" in return for withdrawal from the union. "And the members were gullible enough to fall for it," he claimed.

Collective bargaining may not have been originally meant to include what happened at Packard, but certainly if the majority of any union is more sold on a company's proposal than they are to a union, such action could be called collective bargaining to perhaps its highest degree.

Back in 1938 the foreman's movement began at the Kelsey-Hays Wheel Co. After first being refused admittance to the CIO the foreman's group was granted a charter by CIO in December of that year. During the 1939 strike of UAW-CIO at Chrysler the union went through its first acid test and lost when the National Labor Relation Board dismissed charges of unfair labor practices filed by the dismissed foremen against Chrysler.

NOT until 1941 did the movement again regain momentum. Under the direction of R. H. Keys and three other foremen at Ford Aircraft Engine plant (Pratt & Whitney) the cause was reborn and in November, 1941, 1200 foremen mostly from Ford attended the first formal meeting of the association now known as FAA. This group was not too successful until June 15, 1942, when the NLRB in the Union Collieries case ruled foremen were employees under the meaning of the Wagner Act and could be legally organized. With this formidable tool the FAA started its intensive campaign among all principal auto companies and suppliers. During the war the cause blew hot and cold. On May 11, 1943, the

NLRB reversed its previous decision and for a time the foreman's union was on the ropes. Ford and Packard promptly refused to recognize FAA although both companies had made some agreement with the union. Packard's refusal was difficult to take as in February, 1943, FAA had easily won the election at Packard as the bargaining agent for the foremen.

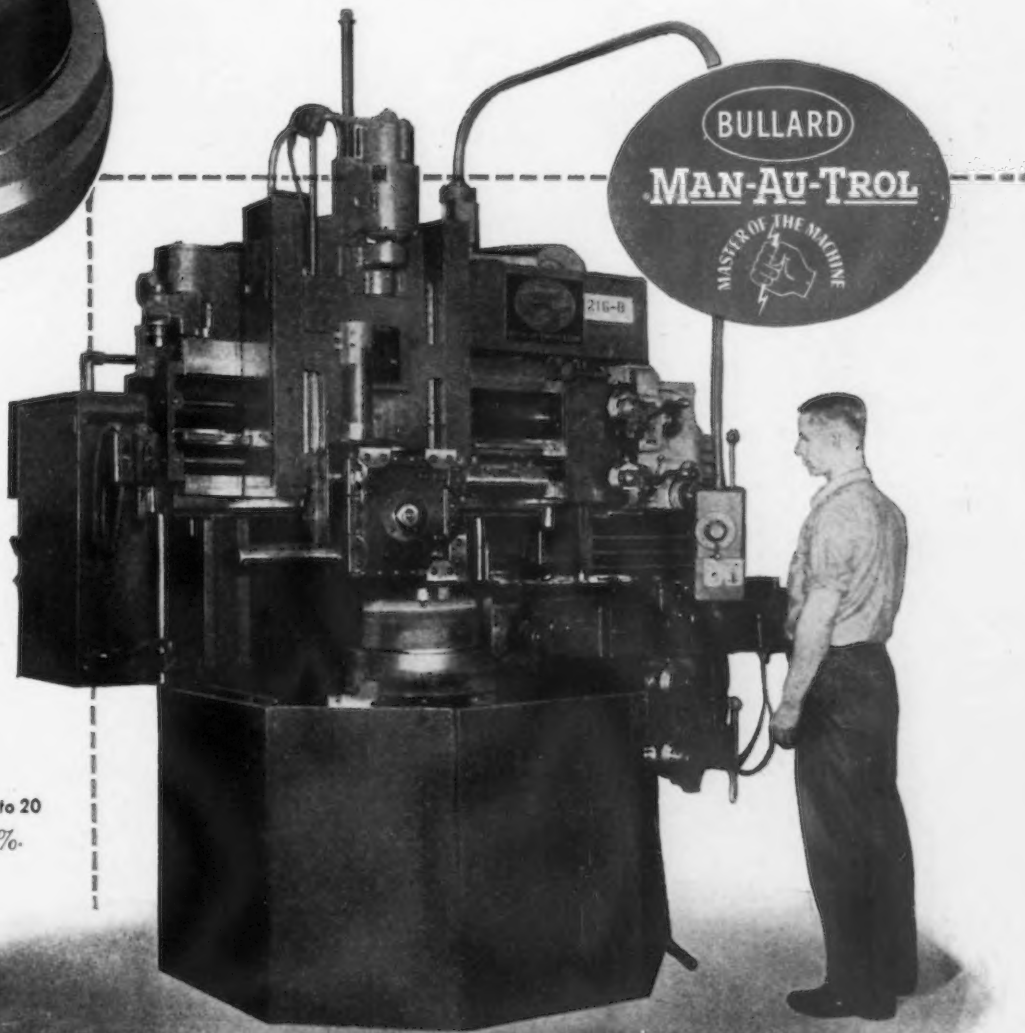
The struggle continued with Keys obtaining limited aid from Phil Murray and the CIO. Shortly after enlisting the CIO's help the FAA lost its first strike at Ford. The union was defeated despite the fact that Murray's pledge to not permit any UAW-CIO member to take the job of an FAA foremen during the strike, was carried out to the letter. During 1943 and 1944 the FAA was embroiled with many auto plants. Strikes and hearings involved not only NLRB but the House Military Affairs Committee, Congress and the nation at large. Since 1945 the FAA has enjoyed the fruits of its early stormy struggles and has negotiated contracts with many employers in most industrial centers east of the Mississippi River. The final victory gained by FAA under the Wagner Act, however, seems to have been nullified by the last labor bill passed on June 6 by a Republican Congress.

THE temporary agreement reached by Ford Motor and the UAW indicates that this union is not accepting the new labor law as a death knell to privileges the union formerly enjoyed. The unions agree that the Taft-Hartley stipulations are the law, but at the same time they imply they will make every effort to get around it. There is considerable sentiment here that Ford capitulated on the very points for which business has been fighting over the years. Some observers point out that the representatives to Congress, who pushed the new law and thereby risked their political futures, deserve far more support by a leader of the cause for which they cast their vote. Whether Ford's decision means a temporary retreat and that the

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Here are shown before and after shots of a cast iron drive wheel for a Motor Grader, machined on a 30" **BULLARD** Man-Au-Trol Vertical Turret Lathe by Austin-Western Company, Aurora, Illinois. The former method, employing two machines, took 1 9/10 hours. On the **BULLARD** Man-Au-Trol V.T.L., actual cutting time was reduced to 20 minutes... a time saving of 82.4%.

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company intends to hold the line at a later date, these observers say, is not the point—rather it was the principle involved.

Having averted an immediate strike Ford Motor assembly line started again on Wednesday, Aug. 13. Production has been confined to two-door and four-door models and the management reports it cannot predict from day to day what rate of operations can be maintained. Friday there were still 15,000 idle workers at the Rouge plant. Progress has not been too good between the Murray Corp. and the UAW-CIO. Peace talks with Murray were reopened on Aug. 13 at the U. S. Conciliation Service Offices before a three-man mediation panel. Three new demands were presented by the union and have been added to the

initial issue of the financial responsibility of unions under the Taft-Hartley Law in event of strikes. The new demands include a straight 15¢ hourly wage hike instead of the 11½¢ increase, six paid holidays and that Murray Corp. eliminate certain inequalities in jobs. Emil Mazey, UAW-CIO codirector also demanded that the company eliminate the 15¢ wage differential between the Detroit and Belding, Mich., plants. The Murray strike which started July 23 has slowed down Studebaker's production as well as Ford's, and that of the Dodge Truck plant at Chrysler Corp.

THE opinion here last week was that Murray Corp. would not make a last ditch stand on the issue

of union responsibility and force the union to play its full hand. These observers say the die has been cast and judging from recent events the automakers prefer to take a practical attitude—do everything possible to keep running.

Representative Fred A. Hartley very recently warned against such practice in a talk given here. "Let me serve notice to employers all over the nation, if I find they bypass the law I'll invite them to Washington to explain," he declared. Although he spoke before the International Apple Assn. convention in the Hotel Statler he wasn't exactly polishing any apples when he concluded, "The Taft-Hartley Law is now the law of the land and as far as I am concerned I'll see it enforced and lived up to."

Willys-Overland Plans More Integrated Plant

Toledo

••• Cabs and pick-up boxes for Willys-Overland's two and four-wheel drive trucks are being assembled in the company's new body shop, and within a short time stampings as well as the assembly of bodies will take place here rather than in the plants of suppliers, according to W. E. Paris, vice presi-

dent in charge of operations.

Mr. Paris said the move will make Willys a more nearly self-contained manufacturing plant, and will boost employment by at least 700 workers.

Heretofore the stampings mentioned above have been made by the Hayes Mfg. Co., in Grand Rapids. The move will not affect the stamping and assembly of station wagon bodies as they will continue to be made by Hayes. Mr. Paris said the set-up in operations likewise will

not alter production of Jeep bodies which will continue to be made by the American-Central Co. in Connersville, Ind.

The present assembly capacity is 167 units per day, but the company contemplates tooling up to meet a daily production schedule calling for 360 bodies. The next step will be to move stamping equipment from Hayes to Willys-Overland for the parts common to the stamping and assembly of the sedan delivery. This is expected to be completed by September.

Mr. Paris said that the \$5 million body stamping shop, an integral part of Willys-Overland's \$21 million expansion move inaugurated a year ago, is nearing completion. Fifty-three presses have been installed in the new stamping shop, ranging from a 1400-ton capacity triple-action press to a 160-ton capacity, single-action press. They will stamp out fenders, side, floor, roof, door and cowl panels.

NO SECRET: This much of the new atomic pile now being built at Brookhaven Laboratory on the former site of Camp Upton, Long Island, is no secret. Here Dr. Lyle B. Borst, left, designer of the atomic pile, points out some features to Sumner T. Pike, second from left, a member of the Atomic Energy Commission; William W. Waymack, second from right, another Commission member, and Dr. Philip M. Morse, director of the Brookhaven Laboratory.



Inco Boosts Earnings

The report of The International Nickel Company of Canada, Ltd., and subsidiaries for the 6 months ended June 30, 1947, issued by Robert C. Stanley, chairman and president, shows net profit of \$16,460,339 after all charges, equivalent, after preferred dividend requirements, to \$1.06 a share on the common stock.

This compares with net profit of \$12,211,663, or 77¢ a common share, in the corresponding period a year ago.

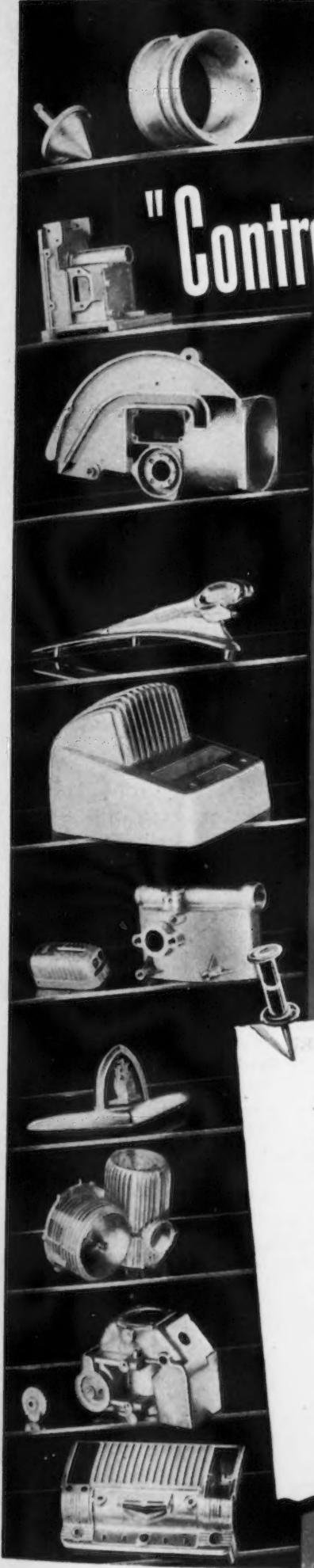
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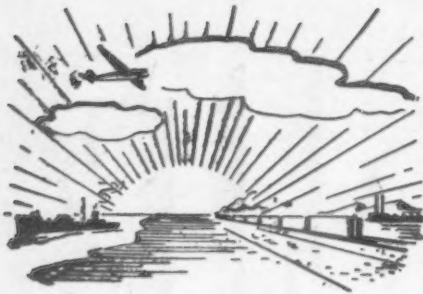
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• Industry scrap survey may be producing results . . . RFC rejection of Kaiser loan reduction not unexpected . . . Veto of metals price legislation felt in Utah.



SAN FRANCISCO—Perhaps it is the “heat of all hell” so freely mentioned at recent congressional hearings in Washington, and in this case generated by the iron and steel industry itself, which is beginning to thaw the stockpiles of scrap which have been carefully shielded from western furnaces by governmental agencies.

According to H. W. Christensen, purchasing agent for Columbia Steel Co. and chairman of the Steel Foundry & Scrap Industries’ Committee for Expediting Iron and Steel Scrap, there is encouraging evidence that the report of his subcommittee to Robert W. Wolcott, general chairman of the committee, is producing results. Not that any of the 350,000 tons of scrap identified and located by the local subcommittee has been offered for bid, but there have been numerous Washington phone calls and visits of inspection from representatives of the Army and Navy to the sites where the scrap was located.

Seven government depots in northern California were inspected by members of the committee and representatives of the WAA and it was from joint estimates that the total of 350,000 tons of material suitable only for scrapping was made. Some members of the committee and observers believe

that this estimate is conservative and that the total amount of surplus and obsolete war materiel good for nothing but scrap will exceed 400,000 tons.

At the time the inspections were made in July, it was reported that less than 1 pct of this tonnage is in the hands of WAA inventories and hence could not be disposed of in any form. It is essential that the government agencies holding ownership of this property release it to the WAA for disposal as quickly as possible.

At River Bank, Calif., the committee estimates there were approximately 8000 tons of machine tools, pipe fittings, valves, structural plate and shapes of which only 50 pct might be considered usable. The Army has released considerable tonnages to the WAA which has already screened and disposed of a large part of it and WAA inventory is expected to be cleared up by the end of September.

Shipyards located in Marin county and at Richmond, Calif., contain an estimated 150,000 tons of special pipe fittings, flanges, valves, bolts, miscellaneous special hardware and “fixed scrap” consisting of nondemolished steel wharf cables, platforms, tracks and other fittings suitable only for ship construction. It is further estimated that a large percentage of machinery tools, fittings and other metal forms will eventually be scrapped but was not included in the original estimate.

The Richmond shipyard is scheduled to be cleared of all personal property before the end of September. It is pointed out that the scrap located both in Marin county shipyards and Richmond shipyards is predominantly “fixed scrap” and is under the jurisdiction of the Real Property Div. Much of this material will have to be sold with the entire installation and probably the cost of demolition would have to be borne by the successful bidder as it has no value except in ship construction.

THE largest single deposit of scrap located was the estimated 200,000 tons at the Army depot at Lathrop and the Naval

Supply Annex at Stockton. About 800 tons of miscellaneous prepared scrap was identified here along with large tonnages of land mine demolition apparatus, Bailey bridge gear, heavy hardware and so forth. The prepared scrap is located at Lathrop and the Naval Supply Annex at Rough and Ready Island appeared to be well cleaned out and in continual turnover.

The large tonnage of scrap at Lathrop had not been declared surplus to the WAA according to Leland C. Dedo, regional director for the WAA, and remained under the jurisdiction of the Army.

The Benicia Arsenal and Mare Island Navy Yard were found to have approximately 10,000 tons of material suitable only for scrap. This consisted primarily of spare parts for LVT’s and miscellaneous spares for ships and barges. Scrapping operations at Benicia apparently were moving along and Mare Island activity appeared adequate to the committee. Site clearance orders had been issued on Mare Island and all scrap at that location in WAA inventory was scheduled for disposal by the end of September.

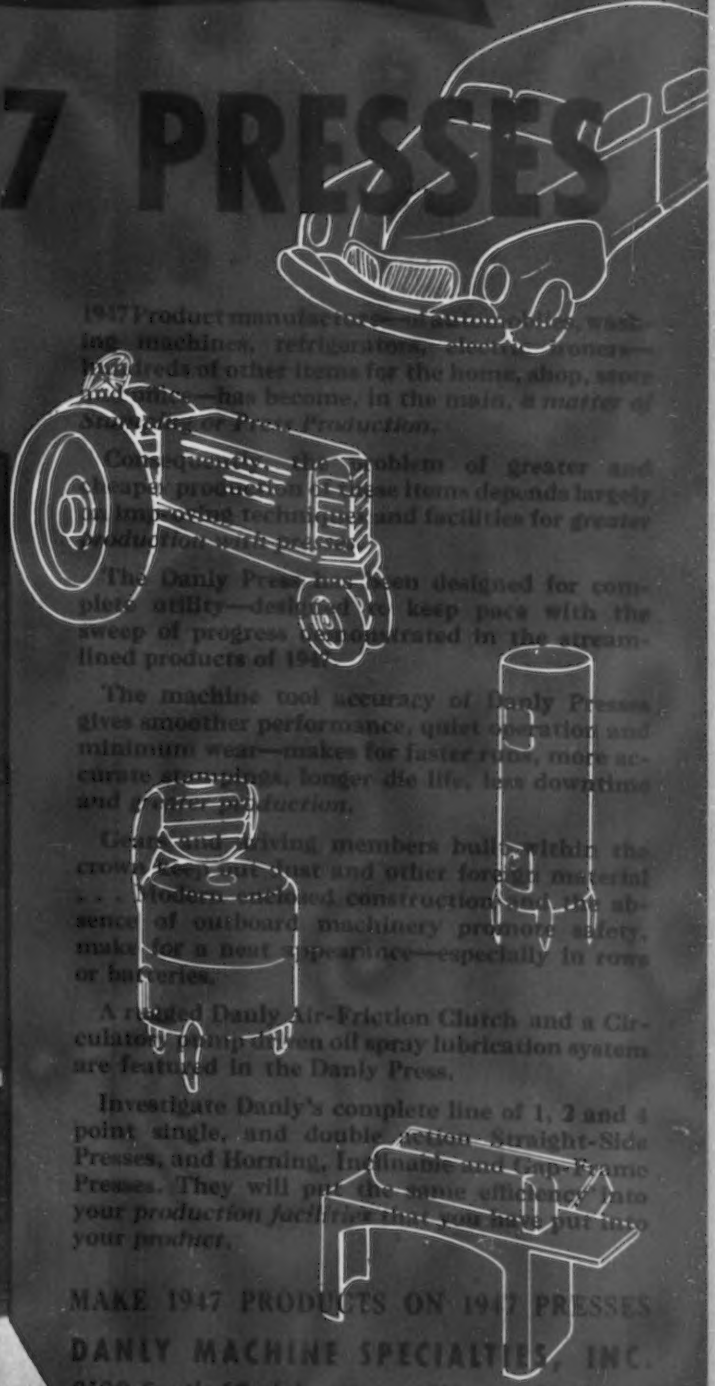
The committee recommended that all machine tools over 25 years old be mutilated and immediately sold for scrap and that the newer tools of special nature such as the LeBlond special gun boring lathes, Betts-Bridgford special shell turning lathes and similar equipment be prepared immediately for storage unless the Ordnance Dept. considers the equipment obsolete and unsuitable for use in the event of another war. In that case it is recommended that the material be mutilated and scrapped.

The only lot of machine tools inspected was that stored at River Bank, Calif. There were a few machine tools at the Marin Shipyard but these were all well over 25 years old.

The committee lays responsibility for delay in getting this scrap back into the channels of production squarely at the doors of the Army, Navy and Maritime Commission because of the laxness in these agencies in declaring useless material surplus and turning it

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over to WAA for release. In concluding its report through Mr. Christensen, the committee stated: "As a means of energizing the flow of all of these materials into legitimate scrap channels, once they are offered for sale, the committee suggests that the successful bidders be required to sign a warranty which will guarantee that the materials be mutilated, properly prepared and shipped immediately for remelting purposes. Also, to avoid these materials from falling into the hands of unscrupulous persons and speculators, the committee recommends the bidder be required to state the number of working days required to process and ship the materials as scrap to the steel mills and foundries. The WAA should, in evaluating bids, consider this as one of the factors before making an award."

According to purchasing agents on the Coast, shipbreaking continues in a lethargic and dilatory manner and still fails to deliver its full potential of necessary open-hearth fodder. Last week Kaiser Co., Inc. was high bidder on four cargo ships which are destined for breakage at the Richmond Yard 3. Obviously this operation cannot be completed before termination of the company's contract for use of Yard 3 in September, but prospects for renewal of Kaiser's lease on these facilities are believed to be good.

A portion of the scrap being produced in shipbreaking at the Kaiser Richmond yard has been going to Columbia Steel Co. at Pittsburg, Calif., on a reciprocity basis in return for scrap purchased in the southern area by Columbia and resold to the Kaiser Co. for use at Fontana.

Pacific Bridge Co., Moore Dry Dock Co. and Kaiser Co., Inc. last week also bid on a number of LST's which will eventually find their way to the furnaces.

REJECTION by the RFC of Henry J. Kaiser's appeal for a write-off of approximately \$85 million of its loan covering the steel plant at Fontana was not unexpected in informed circles here.

The Western States Council which has carried the fight for a reduction in this loan to Washington has not announced as yet what its next step will be but it is recognized that future maneuvers must be along political lines if

Congress is to be influenced in authorizing RFC to make any changes in the loan terms. There is ample evidence to believe that it will be difficult, if not impossible, to swing enough congressional sympathy toward such legislation, particularly at this time when Congress is giving evidence of being economy minded and under Republican control.

Mr. Kaiser's public statement to the effect that the RFC "subsidized" the U. S. Steel Corp. to the extent of approximately \$160 million was not being taken seriously by informed persons who realize that the Geneva plant was a DPC project, declared surplus, and thrown on the market to be bid for by anyone with available capital or resources. The RFC loan to the Kaiser interests was a distinctly different business transaction and under the regulations governing the Reconstruction Finance Corp. is payable in full.

How seriously the man in the street is taking the charges hurled by Mr. Kaiser to the effect that there is a concerted effort upon the part of large steel producers to restrict production to maintain high prices and monopolistic control, could only be determined perhaps by a Gallup poll. However, it is evident from stories in the labor press that he has at least gathered the support of a section of organized labor. Statements made by Walter Reuther of the United Auto Workers and by Mr. Kaiser are quoted freely and the conclusion is drawn for the labor reader that if jobs become scarce "big steel" is to blame.

Some old time steel men are inclined to believe for the sake of clarifying the situation and setting forth all the facts so that the average man can interpret them in his own way, the congressional investigation for which Mr. Kaiser has been clamoring might be a good thing for the industry in general.

SALT LAKE CITY—Immediate reactions to the presidential veto of the metals premium price legislation were both verbal and real in this area. First tangible action was an announcement from International Smelting & Refining Co. that its National Tunnel & Mines Co. operation in the Bingham district will be closed down as soon as mine equipment can be salvaged from underground work-

ings. Reason for the shutdown was given as loss of premiums and impending higher labor costs. The company has been receiving a premium of 8½¢ above the market price for copper; 2.75¢ for lead and 9¢ for zinc.

The company in 1941 completed the \$1,250,000 Elton tunnel from Bingham to Tooele, hoping to strike rich ore bodies and provide drainage for several old workings.

James K. Richardson, manager of the Utah Mining Assn., reported that he knew of no other mines which are closing but said that there would be a period of refiguring and reevaluating costs before the full effect becomes discernible.

The Salt Lake mining exchange took the news calmly, despite the fact that it came at a time when costs were being substantially increased by the signing of new wage contracts calling for a boost of 12¢ per hr and six paid holidays.

The loss of premiums will fall most heavily in this section on those mines which get a substantial part of their revenue from zinc. The open market price on lead approximates the premium price, but there is a spread of several cents on zinc. Local zinc producers have little hope that the open market price will go up to offset the premium losses. They point out that zinc is currently being overproduced; that last month about 10,000 tons more was produced than was shipped; that there are about 500,00 tons of imported zinc concentrates in the country.

One close student of intermountain mining economics sizes up the effects of the elimination of premiums as follows: Some high production cost mines will be forced to close. Others will find it necessary to bypass low grade ore bodies and work only the best. But the effect on total production will be inconsequential inasmuch as the manpower from closed mines will move to the low cost producers.

The high cost mines had no choice but to increase wages even though they might not be able to meet higher costs. They couldn't get the manpower at the old wage, and so would have been forced to close anyway. It is only a question of whether they close because of lack of men or close because of lack of enough income to pay the men.

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• **Republicans to try again on science measure . . . Senator Smith will attempt to compromise differences between Taft and Truman . . . House Small Business Committee hearings likely to make good case for continuation of premiums.**



WASHINGTON—Republican leaders in Congress will make another attempt next year to enact legislation creating a National Science Foundation.

Although Capitol Hill leaders are still smarting under the rebuke handed them by President Truman in vetoing the bill they believe the strong bipartisan support given the legislation indicates basic need for the federal government's first long-range venture into scientific research.

The late President Roosevelt, Mr. Truman and leaders of both parties supported the proposed program which would have started the government on an elaborate schedule of basic research into the fields of engineering, physics, mathematics and other sciences. But Mr. Truman found the final version of the bill not to his liking.

Administration of the National Science Foundation under the bill would have been placed with a director elected by 24 scientist members of the foundation. Mr. Truman said he felt the fact that the director would not be directly responsible to the President would be incompatible

with the principles of sound governmental operation.

Senator Smith, R., N. J., one of the principal sponsors of the bill, told THE IRON AGE this week that he will make an attempt to compromise White House-Capitol Hill differences early in the next session of Congress in an effort to produce a bill acceptable to both the legislative and executive branches of government. This was the first indication given by any legislator as to future chances of the bill's passage. "My only objective is to get the bill through because it is needed," Senator Smith declared. Mr. Truman's veto, Senator Smith said earlier, "emphasizes painfully that cooperation between Congress and the Chief Executive is strictly a one-way street."

Actually, Capitol Hill insistence on removing administration of the science foundation from control of the White House was due principally to Senator Taft, R., Ohio. According to some sources, the Ohioan was so incensed at Mr. Truman's veto of the Taft-Hartley labor bill that he successfully forced the Senate to remove administration of the foundation from political control. But unless Senator Smith can reconcile Mr. Taft's stand with that of the President next year, the bill is headed for another untimely end, majority legislators agree.

REALIZATION of the necessity for encouraging basic research into new fields opened up by wartime experiments brought requests for the legislation from both President Roosevelt and his successor. Dr. Vannevar Bush, wartime head of the Office of Scientific Research and Development, also had advocated establishment of a government-subsidized program of basic research. But despite the unanimous agreement on the need for such legislation, Mr. Truman felt that lack of White House control of such a program was sufficiently abhorrent to warrant exercise of his veto power.

Senator Smith declared that the aim of the bill's proponents from the beginning had been to "keep scientific research out of politics and out of the hands of bureaucratic control." Throughout Capitol

Hill discussion on the bill a battle was waged between those who favored giving the scientists a free hand and those who favored concentration of power in Washington bureaucracy. Mr. Smith thinks it "doubtful" whether the scientists of America would have "been willing to have undertaken this gigantic task of public service had they felt their program would have been subject to veto by some politically-appointed official."

Doubts raised during congressional hearings on the long-range research bill that the 24 members of the foundation might prove to be an autonomous governing body are largely discounted by both majority and minority members of the Capitol Hill committees. Actual policy decisions of the foundation would have been made by a nine-member executive committee elected by foundation members. And much investigatory work would have been carried out by committees exploring assigned subjects before making recommendations to the executive committee.

Rep. Carl Hinshaw, R., Calif., member of the House Committee on Interstate and Foreign Commerce, followed the bill closely through hearing and debate stages. "What we were trying to accomplish was the advancement of basic research on the level of Einstein and the Comptons," Mr. Hinshaw told THE IRON AGE. "We were not aiming directly at furthering the practical applications of research. In studying steel, for example, we wanted the foundation to dig out new studies of potential. What new basic uses can be found for steel?"

ALTHOUGH Congress passed the bill without voting the enabling appropriations, between \$10 million and \$15 million would have been made available for the foundation's work this year through transfers of funds from other government agencies engaged in research. The Departments of War, Navy, Commerce, Interior and Agriculture all have research funds currently available, so that at least \$10 million would have been available for immediate transfer to the foundation. Final liquidation of OSRD, meanwhile, is expected to be com-

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Duties of the foundation are laid down broadly under provisions of the bill, leaving ample room for interpretation by the foundation council. These duties are:

National Policy: Formulation, development and establishment of a national policy for promotion of basic research and education in the sciences.

Basic Research: Initiation and support of basic research in physics, medicine, biology, engineering and other sciences, by making contracts or grants and loans.

National Defense: Carrying out of research as it is related to the national defense by making contracts or grants and loans.

Scholarships: Granting of scholarships and graduate fellowships in the above named sciences.

Foreign Exchange: Exchange of scientific information among scientists of this and other countries.

Coordination of Research: Correlation of the foundation's research programs with those of other public and private groups.

Special Studies: Establishment of special commissions of cancer, heart diseases, polio and other diseases.

IMPORTANCE of this program of what Dr. Bush terms "pure research" is summed up in "Science, The Endless Frontier," his final report on OSRD activities: "Several reasons make it imperative to increase pure research at this stage in our history. First, the intellectual banks of continental Europe, from which we formerly borrowed, have become bankrupt through the ravages of war. No longer can we count upon those sources for fundamental science.

"Second, in this modern age more than ever before, pure research is the pacemaker of technological progress. In the nineteenth century, Yankee mechanical ingenuity, building upon the basic discoveries of European science, could greatly advance the technical arts. Today the situation is different. In the next generation, technological advance and basic scientific discovery will be inseparable; a nation which borrows its basic knowledge will be hopelessly handicapped in the race for innovation.

"The other world powers, we know, intend to foster scientific research in the future," Dr. Bush concludes significantly.

And while it is expected that in-

dustry will continue to spend large sums on applied research and engineering development, it is conceded that private sources of support for basic research institutions have not kept step with the increased need for pure research. And it is in this latter field that scientists feel it is of vital importance to the nation's future security.

HOPPING mad over the President's veto of the premium payment bill, members of the House Small Business Committee are preparing for their hearings on the problems of small and marginal mines with renewed vigor.

Additional hearings have been scheduled for Washington as a result of the veto. Field hearings open in Seattle on Sept. 8.

Committee members expect to prove that a premium payment plan for copper, lead, zinc, manganese and other minerals is necessary for two reasons: (1) To assure continued operation of hundreds of small mines, and (2) to aid the defense stockpiling program and provide adequate domestic reserves in the event of a national emergency. With many mines now shut down, the committee believes that it has the administration in a very vulnerable position.

Claiming that the Presidential veto left the miners high and dry, Chairman Ploeser, R., Mo., told THE IRON AGE that "while the bill President Truman vetoed was not recommended as the permanent solution of the problem, nevertheless, it was a necessary stop-gap measure. President Truman thus took the easy way out in vetoing the bill and proved that his administration has done no planning in the field of minerals. Mr. Truman in his veto message speaks of a long-range program, but he has no long-range program. The only one he has is the one forced on him by Congress which he is not carrying out."

Mr. Ploeser backed the Russell bill which would have established a permanent premium payment program applicable to any or all domestic minerals. This measure was not approved and the bill vetoed by the President was substituted as a temporary measure until Congress could go into the problem thoroughly next January. The committee expects to gather material during the recess which will prove that a comprehensive program is necessary.

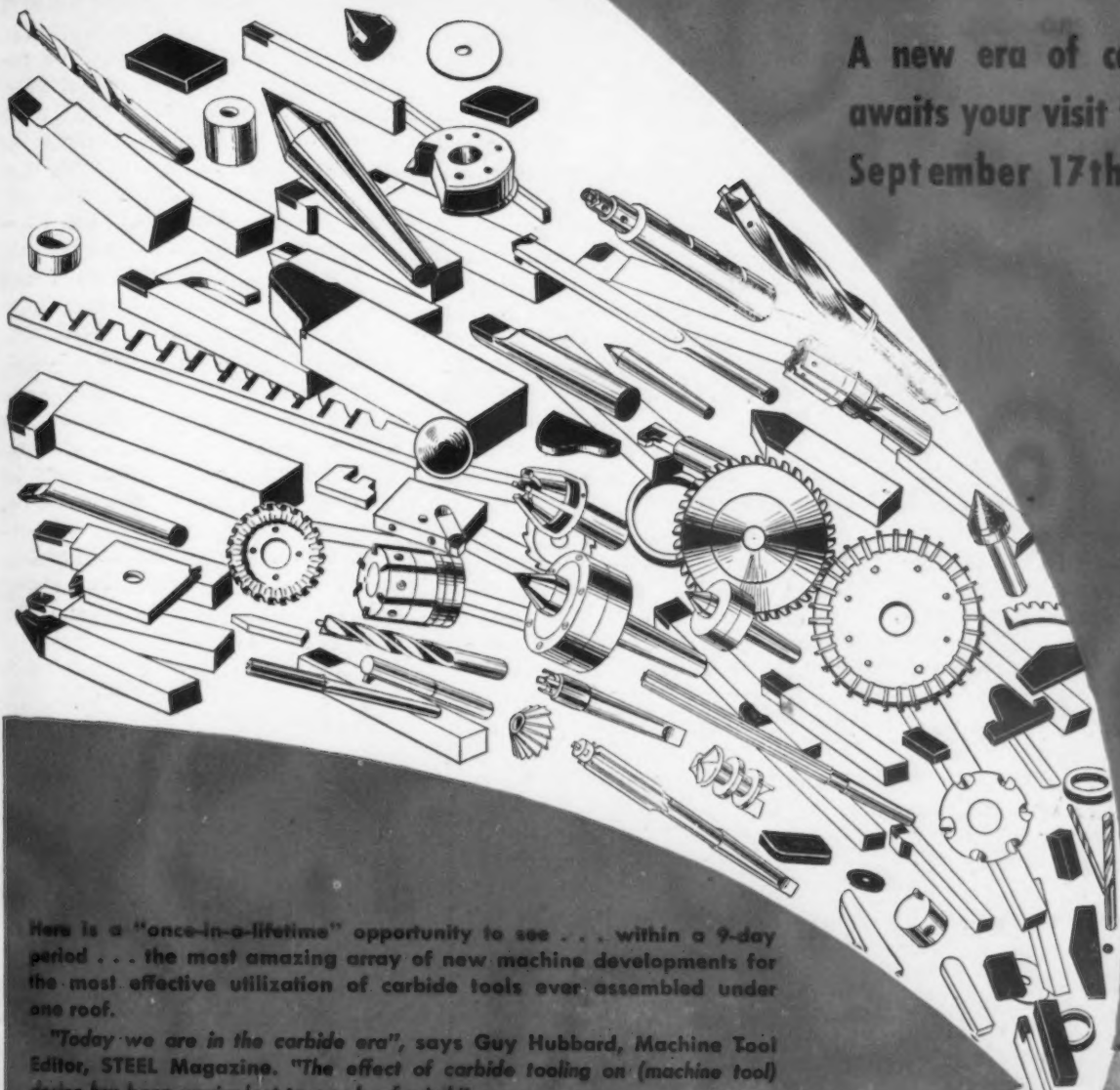
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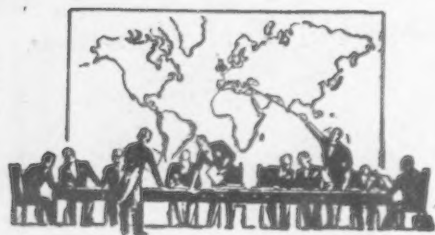


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European Letter . . .

• Attlee's bold speech fails to impress upon British that choice is between food and raw materials . . . Citizens not reacting to national calamity with sufficient effort and responsibility in their individual lives.



LONDON—It would obviously be premature to judge the government's new economic policy from the Prime Minister's speech alone, particularly since the timetable precludes any extended comment on the speeches that were to be made on the second day of the debate by the President of the Board of Trade and by the Chancellor of the Exchequer. The new policy is an improvisation, and bears the marks of its hurried preparation; there is much in Mr. Attlee's bare and bald outline that needs considerable amplification before it can be fully understood.

But in a matter that is in large part psychological, first impressions count for a good deal and if Mr. Attlee's speech has given the country the wrong lead, no amount of later glosses upon it will catch up with the harm done. That any speech of Mr. Attlee's would be arid and uninspiring is, unfortunately, to be taken for granted; he touches nothing that he does not dehydrate.

But there was room for hoping that the substance of what he had to say would overcome the defects of the manner and jolt the country into a sense of reality. The measure of his failure lies in the almost audible sigh of relief that went through the country. "Not so bad, after all" is the general comment; and there could hardly be a more

disastrous reaction to have provoked.

There are two tests that can properly be applied to the government's plans. In part, those plans must inevitably be a purely passive adjustment to external circumstances; and there the test is whether all traces of false optimism have been adequately squeezed out. But the new proposals should also include a frank recognition that the economic policy pursued to date inside the country has been partly responsible for the present mess and a firm determination to seek and apply the remedies. Judged by the first test, the government's proposals are not very satisfactory; and judged by the second, they are downright unsatisfactory.

UNDER the first head—that of the passive defense measures against the dollar stringency—there is some evidence that Ministers are at last frightened of the position that is developing, and that they are trying to frighten the public. But they cannot yet bring themselves to say more than "Boo" to a people that is by now inured to crises.

None of the cuts in external expenditure that is proposed measures up to what the public had steeled itself, in the last few days, to expect. The reduction in the total

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of the armed forces by 80,000 by the end of the year is merely derisory. It has long been quite impossible to understand the government's mental process on this subject. It has committed itself to a conscription policy that will bring the total of the forces down before long to somewhere between 600,000 and 750,000; why on earth cannot it be done now?

People were expecting the total withdrawal of the basic petrol ration; but it is only to be cut by one third. On travel allowances and film remittances, something much more drastic had been expected. And lastly, in the matter of food, there had been a dismal

expectation of a halving of the meat ration and a cut in the fats ration.

But all the Prime Minister said was that some items would be "up-pointed," that there would be restrictions (unspecified) on meals in hotels and restaurants and that there might be further cuts (still less specified) later on. This is a dereliction of duty. The Prime Minister should have told the country squarely that it is necessary to choose between food and raw materials, and that it is the raw materials of productive industry that are really essential in the ultimate analysis.

It is better to go hungry and still be able to work for salvation than to keep full stomachs and live on charity. Mr. Attlee should have made the country realize that this is its bitter choice; instead, he has encouraged the belief that something will turn up to put off the necessity of choosing.

THE most encouraging announcement in this part of the Prime Minister's speech was that the government has at last decided to break its embarrassed silence on the ruinous nature of the conditions attached to the American credit and to tell the United States government squarely that it cannot be borne. This should have been done 2 years ago; and it would have been done 2 years ago if the British negotiators at Washington had had a larger dash of realism and a smaller admixture of ideology. The government has made no greater mistake in its 2 years of office than to gag the free discussion of the American loan in December 1945.

If the one half of Mr. Attlee's speech was merely weak, the other half was definitely wrong-headed. Where there is need for a reversal of economic policy at home, he promised merely an intensification of the wrong policy hitherto pursued. It cannot be too often repeated that the present troubles of the nation are only in part of external origin; the other part is due to the mistakes that have been made at home.

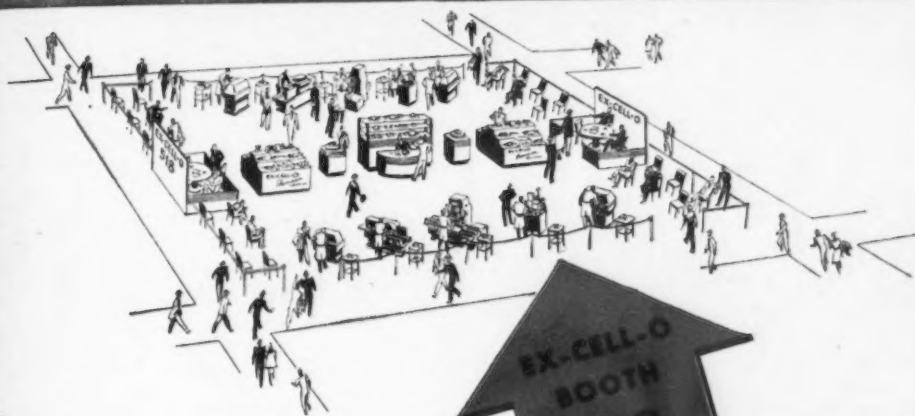
For 2 years the government's

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economic policy has been made up of controls, rations, restrictions, priorities, exhortation and inflation. Now that it has landed the country in such a mess, all that the government can think of to prescribe is a lot more of the same medicine. Since it failed to cure the patient, every ingredient is to be strengthened.

There are to be new controls over capital investment, the one sure long-term remedy. There are to be tighter allocations of materials. There are to be new restrictions on the freedom of employers and workers. There are to be new priorities for exports—but without any real assurance that the suppliers of essential materials and components for the export trades will not get caught up in the new restrictions. There are to be plenty more exhortations, with new and higher targets set in blithe indifference to the fact that the old and easier targets are not being attained.

And, lastly, there is to be more inflation. When supplies available for the home market are cut down without any reduction of spending power, that by itself intensifies inflation. But in fact spending power will be increased, for the extra hours that the unions are to be asked to work will have to be paid for at overtime rates, and the TUC's statement is significantly silent about the government's plea for a truce to wage claims. Why should this intensification of the mixture-as-before be expected to work any better than it has worked hitherto?

These doubts about the attainability of paper targets apply with particular force to the policy of agricultural expansion now announced. It is not very easy to quarrel with the target. Unless

British exports are to be much more successful in capturing and holding the world's markets than seems at all likely, some permanent limitation of British imports will be necessary long after the present dollar crisis has been surmounted.

It is not unreasonable to say, in these circumstances, that an increase of 20 pct in the output of British agriculture is desirable. But is it possible? Can it be done at all—and particularly within 5 years—without a far-reaching reconstruction of the whole structure of British agriculture? And if the attempt is made to accomplish it by the methods of the last 8 years—that is, by giving farmers and farm workers ever-rising cash inducements—will not the cost be a very large fall in the standard of living of the British people? It is not because it proposes inadequate targets that the government's proposals fail to inspire confidence, but because it does not give any reason for believing that, this time, the targets will be attained.

VOICES have been heard in the last few weeks urging that what is wrong with the country is not wholly economic, but largely moral. That is true. But the distinction between the economic and the moral is not as absolute as is often supposed. Faulty economic policies can lead to bad morale.

The whole of the working class, the great majority of those whose incomes are derived from business, and virtually every business firm, have a greater feeling of individual prosperity today, for all the shortages, than they have ever experienced before. Of course they do not react to a national emergency that is simply something they read about in the papers and do not experience in their own lives.

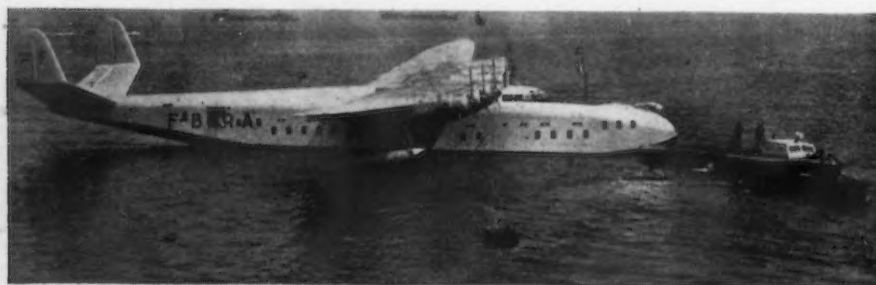
NOT until the lash of economic adversity ceases to be a metaphor in statesmen's speeches and becomes something that the individual feels on his own back will the "moral" crisis be surmounted. If the government wants real economy throughout the length and breadth of the land, it should so mold its economic policy that every individual starts counting his pennies again and every business firm begins to get anxious about its profit-and-loss account.

It may be that the tide has already turned and that the inflationary pressure is relaxing; but if so, it is due to the despised "blind economic forces" and not to anything the government has done. The healthy effects of Stock Exchange losses, after 7 years of Stock Exchange profits, can already be perceived; but the Stock Exchange has fallen because of the collapse of Mr. Dalton's policy, not because of any success it has had.

The government ought to be hurrying on the disinflationary process by every means in its power instead of impeding it for fear of creating unemployment. A moderate degree of unemployment would, in fact, be a godsend, since there is nothing else that will get the labor for the mines, for the textile industries and for agriculture, and that will really clear the way for exports.

A moderate degree of unemployment in the next few months—enough to restore some elasticity to industry—is, in fact, the only thing that will now save the country from the mass unemployment that would follow upon a complete breakdown of imports. It is, of course, "unprogressive," "reactionary" and "socially irresponsible" to say this. But it happens to be the truth. And it is a truth that the government, with the great mass of the people behind it, is still resolutely determined to ignore.

A RECORD? Speaking of building flying boats (and who isn't?) this one took 8 years to finish. French manufacturers had nearly completed it when the Germans arrived, so it was dismantled and hidden until the liberation. It recently visited the English Hythe, Hampshire, port.



104—THE IRON AGE, August 21, 1947

To Complete Iron Plant

Washington

••• McCrossin & Co., Rusk, Tex., plans to complete and place into operation a charcoal and pig iron plant, construction of which was begun by the government prior to the end of the war. At a later date, it will manufacture charcoal iron. It was sold to McCrossin for \$300,000.

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Use a ROBERTSON *Cool-Cut Wheel*

Grinding hobs, a tedious, time-consuming operation at best, becomes comparatively easy when you use a Robertson Cool-Cut Wheel. *Chip clearance?* The "open" structure of this revolutionary wheel allows more than adequate space for chip clearance! This means fast and cool grinding of hobs of any size, of the hardest steel.

Large hobs with $1\frac{1}{2}$ " or greater pitch may be successfully ground with a 10" x 1" x 1" WA46-J2V Robertson Wheel. On smaller hobs, a Robertson $7" \times \frac{5}{8}" \times \frac{3}{4}"$ RA60-J2V will give highly satisfactory results. There

will be no burning and very little heat generated. Experience has shown that you can expect a 50%, or greater, saving in grinding time when you use a Robertson Cool-Cut instead of a conventional wheel.

For faster and more accurate tool-grinding of any kind, make sure your grinding wheels are Robertson Cool-Cuts . . . the wheels that are precision-built for the toughest jobs. Write for your free copy of the pocket booklet "HOW TO BUY PRODUCTION TIME," which tells you all about Robertson Wheels.

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PERSONALS

• • •

• **Willis J. Bruninga** has been promoted to manager, building trade sales, of Keystone Steel & Wire Co., Peoria, Ill. Mr. Bruninga has been with Keystone Steel & Wire for 18 years. During his service with the organization he has advanced through sales department posts as clerk, statistician, correspondent, supervisor, and district sales director.

• **Charles W. Schooley** has been appointed merchandising manager of Cadillac Motor Car Div., Detroit. He succeeds **Charles H. Betts**, resigned. **Charles E. McGinnis** has been brought to Cadillac to serve as assistant merchandising manager. Mr. McGinnis had been assistant manager of the General Motors Acceptance Corp., Kansas City office.

• **William R. Holmes** has been promoted to assistant district manager of U. S. Steel Supply Co.'s warehouse in Newark, N. J. He has been associated with the U. S. Steel Corp. subsidiary for nearly 8 years, beginning as a ticket checker in the Chicago order department. Mr. Holmes filled various positions in sales and order departments in the company's general offices in Chicago until 1942, when he became associated with the Milwaukee sales office. He has been serving in an outside sales capacity until receiving his current promotion.

• **L. R. Constantine** has been appointed welding engineer of the Elliott Co. of Jeannette, Pa. He was formerly employed by Dravo Corp. and M. W. Kellogg.

• **Charles I. Crais** has been appointed sales representative in the states of Alabama, Arkansas, Louisiana and Mississippi for Lukens Steel Co. and its divisions, By-Products Steel Corp. and Lukenweld, Inc. Mr. Crais will be located at New Orleans. He has been employed successively with the Western Electric Co. as engineer of manufacture; with Standard Electric Time Co. as production engineer, and with the Engineering Specialty & Mfg. Co. as sales engineer. In the past year he was also associated with the late **Charles W. Wood**, who was sales representative in New Orleans for Lukens, By-Products and Lukenweld.

• **John F. Scott** has been appointed chemical and metallurgical sales representative of the New York district office of Globe Steel Tubes Co. He joined Globe Steel Tubes in 1940 as metallurgist in the laboratories located at Milwaukee, and early in 1947 was transferred to the Milwaukee general sales office as chemical and metallurgical sales representative, which duty he performed until his appointment to the New York office.

• **Reginald A. Smith** has been appointed sales manager of the DeVlieg Machine Co., Ferndale, Mich. He was formerly connected with Alfred Herbert, Ltd., Coventry, England, and was resident representative in the United States for the Herbert organization from 1939 to 1945.

• **Joseph A. Dubray**, movie cameraman and technician, since 1929 associated with the Bell & Howell Co., Chicago, has retired.

• **David W. Hopkins** has been promoted to executive vice-president of R-S Products Corp., Philadelphia. Mr. Hopkins has been with R-S Products since 1939, and directly previous to his new position was in charge of its valve division.

DAVID W. HOPKINS, executive vice-president, R-S Products Corp.



• **Laurence S. Dahl**, general superintendent of Carnegie-Illinois Steel Corp.'s Irvin works since 1940, has been appointed general superintendent of this U. S. Steel subsidiary's Youngstown district, succeeding **A. C. Cummins**, deceased. **John H. Elliott** has been appointed general superintendent of the Irvin works to succeed Mr. Dahl. Mr. Elliott started with U. S. Steel in 1919. In 1940 he became assistant general superintendent, the position held at the time of his present appointment. **Arno L. Billeter** has been appointed assistant general superintendent of Carnegie-Illinois Steel Corp.'s Irvin works. **Albert J. Berdis** succeeds Mr. Billeter as superintendent of the Vandergrift plant of Irvin works. Mr. Berdis was assistant to the general superintendent at the time of his new appointment.

• **Carl J. Dinic** has been appointed manager of commercial research for Rheem Mfg. Co. He will make his headquarters in the New York office. Prior to joining Rheem, Mr. Dinic was with the American Locomotive Co., with U. S. Steel Corp. of Delaware and was formerly associated with Eastern Gas & Fuel Associates.

• **Earl C. Riegel** has been promoted to sales agent in the mine car sales division of American Car & Foundry Co. He succeeds **R. A. Lockard**, who has retired. **Karl R. Dietterick** has been promoted to sales agent in the anthracite territory, succeeding **A. E. Smith**, who also has retired. Both gentlemen will make their headquarters at the ACF Berwick, Pa. plant. Mr. Riegel's 10 years' service with ACF includes considerable experience in shop inspection work, followed by several years' drafting work in the various departments. Mr. Dietterick has spent 15 years with ACF in both office and shop departments.

• **Robert G. Schulte** has been named zone manager of Chevrolet Motor Div. at St. Louis; **Marvin Hoffman** has been made zone manager at Omaha. Mr. Schulte, who has been with Chevrolet since 1925, succeeds **T. W. Gordon**, recently resigned. Mr. Hoffman, who succeeds Mr. Schulte at Omaha, first served as a Chevrolet sales representative in 1932.

PERSONALS

• **Roy L. Leventry** has retired from active management of Republic Steel Corp.'s Youngstown district but will remain with Republic as a consultant and will maintain offices in Youngstown. **J. H. Graft**, who has been assistant district manager of Republic's Buffalo district since 1943, succeeds Mr. Leventry. **J. H. Slater**, assistant district manager, Cleveland district, has been made senior assistant district manager. **M. D. Wald**, assistant district manager of Warren district, becomes assistant district manager, Cleveland district. **Harry L. Allen, Jr.**, openhearth superintendent and acting assistant district manager, Cleveland district, becomes assistant district manager, Buffalo district. **P. P. Echols**, who has been on special metallurgical duties, has been made assistant to the district manager, Warren district, and **H. J. Walker** has been promoted from openhearth superintendent to general superintendent of the steel works, from coke works to blooming mill inclusive, Warren district.

• **Charles Stanton** has been appointed district field-engineer in the Philadelphia office of Chain Belt Co., Milwaukee. He formerly held a similar position in the company's Detroit office.

• **Robert A. Weinhardt** has joined Willys-Overland Motors, Toledo, as automotive power plant engineer. Mr. Weinhardt had been associated with Packard during the war as a production engineer for aircraft engines. In 1945, he joined Graham-Paige to design the chassis for the Kaiser-Frazer line.

• **Marshall E. Neil** has been appointed general sales manager of the Mid-States Equipment Corp., Chicago. Mr. Neil has had 15 years of diversified experience in the marketing of varied lines of electrical equipment.

• **O. Fred Yando** has been made assistant regional manager of Ford Motor Co.'s central region, Dearborn, Mich. He has been manager of the central regional and business management department since 1946.



E. B. CLEBORNE, executive vice-president, Allegheny Ludlum Steel Corp.

• **E. B. Cleborne**, vice-president and director of Allegheny Ludlum Steel Corp., Pittsburgh, has been elected executive vice-president of the corporation. Mr. Cleborne has been a vice-president and director of the corporation since Allegheny Steel and Ludlum Steel merged in 1938. Prior to that he was a vice-president and director of Ludlum Steel Co. He is also president of the Wallingford Steel Co., Wallingford, Conn., a subsidiary company of Allegheny Ludlum, and will continue in that position.

• **T. P. Thomas**, service technical manager of Packard Motor Car Co., Detroit, since 1945, has become marine service technical representative. **Norman A. Lull**, service merchandising manager since 1944, succeeds Mr. Thomas and is, in turn, succeeded by **Byron R. Horsley**, who was manager of the Packard service parts divisions from 1920 until 1943 when he was transferred to the aircraft engine division.

• **E. S. Cramer**, recently of Norton Co.'s sales engineering department, Worcester, Mass., has been appointed abrasive engineer for a section of the Pittsburgh district. He will replace **L. W. Grubbs**, who has resigned to enter the field of consulting mechanical engineering.

• **Wendell J. Farischon** has been appointed news editor of "Caterpillar's" News Service, Caterpillar Tractor Co., Peoria, Ill. Mr. Farischon has a background of 18 years of newspaper experience, prior to World War II. Coming out of the Army he became associated with the Caterpillar Tractor Co. news service in 1946.

• **Jerry Reichart**, formerly news editor for the Caterpillar Tractor Co., has taken a new position as editor of Employee Publications at the Cutter Laboratories, Berkeley, Calif.

• **Frank M. Higgins** has been appointed the new manager of the Reeves Pulley Co. branch office in Atlanta, Ga. Mr. Higgins has been directly associated with the design and installation of Reeves variable speed equipment for the past 14 years, spending a number of years as assistant to the chief engineer and the last 3 years as a sales engineer, working out of the home office in Columbus, Ind.

• **Kenneth W. Sickinger**, formerly a department manager with Oakes & Co. of Chicago, has been placed in charge of advertising for the radio division of Stewart-Warner Corp., Chicago. Prior to his connection with Oakes & Co., he was assistant general sales and advertising manager of the Belmont Radio Corp. in Chicago.

• **Alfred Marchev**, formerly president and chairman of the board of Republic Aviation Corp., has been elected to the board of directors of Aircraft Screw Products Co. of Long Island City, N. Y. Mr. Marchev is also president of Gordos Corp. and a director of General Precision Equipment Corp.

• **Dr. John N. Mrgudich** has been appointed research director of the electrical divisions of Winchester Repeating Arms Co. and Bond Electric Corp., divisions of Olin Industries, Inc., New Haven, Conn. Director of research and associate chief engineer of the Burgess Battery Co., of Freeport, Ill., for 6 years, Dr. Mrgudich was chief of the photograph branch of the Army Signal Corps before coming with Winchester.

- **Howard F. Kidwell** has been placed in charge of fleet sales, including national account sales and state business, of the B. F. Goodrich Co., Akron, Ohio. He has been with the company since 1929, in retail tire sales until 1942 when he joined the automotive, aviation and government sales divisions in the Detroit district. **Thomas I. Jenkins** will be in charge of industrial tire sales. He has been with the company since 1925, had previously handled industrial tire sales for the automotive, aviation and government sales division.
- **Oscar Brewer**, sales engineer of Leeds & Northrup Co. and for several years Philadelphia industrial division sales manager, has retired after nearly 39 years with the organization. **H. R. Abey** is his successor as Philadelphia industrial division sales manager.
- **J. G. Green** has been appointed midwestern representative for the Baker industrial truck division of Baker-Raulang Co., Cleveland. Mr. Green will make his headquarters at Chicago. He had been connected with the Westinghouse Electric & Mfg. Co. for 11 years. In 1935 he established the J. G. Green Co. in Pittsburgh. Mr. Green later served as assistant sales manager of the Louis Allis Co. in Milwaukee and for the past 5 years he was assistant general manager of the Philco Storage Battery Div., Trenton, N. J., in charge of sales.
- **Charles T. Leigh** and **Ewart W. Goodwin** have been appointed to the board of directors of Solar Aircraft Co., San Diego. **Joseph E. Padgett** has been appointed to serve as director of manufacturing at the San Diego plant and **Leon T. Noel** will serve as budget director.
- **Dr. A. Lloyd Taylor**, formerly vice-president in charge of research and development for H. L. Shaw & Sons, has accepted a position as research supervisor in the Wyandotte Chemicals Corp. research laboratories, Wyandotte, Mich.
- **F. G. Hoyt** has been appointed general manager of the woven wire fabrics division of John A. Roebling's Sons Co., Trenton, N. J. Mr. Hoyt will be assisted in his new capacity by **J. Fennell Berger**, assistant manager of sales, and **F. Clifford Peet**, superintendent of production.
- **George H. Voelker** has been designated the Latin American representative for the General Box Co. of Chicago. His duties will be to supervise sales of the company to Central and South America and the West Indies. Mr. Voelker will retain his office in the New Orleans division of the company where he has been located for several years as sales manager of the division.
- **William S. Ginn** has been made assistant manager of sales of transformer division of the General Electric Co., Pittsfield, Mass.
- **R. E. Pauley**, district manager at Pittsburgh, becomes sales manager of Goodyear Tire & Rubber Co.'s molded goods plant at St. Marys, Ohio. He is succeeded by **Robert B. Warren**, who has been eastern railroad sales manager for Goodyear in New York City. **Howard T. Martin** has been named district manager of mechanical goods sales at Dallas. Mr. Martin has been field representative for several years.
- **Wade A. Eskridge** has been appointed district manager in the midcontinent territory of Twin Disc Clutch Co. to take charge of operations in the Tulsa office. **H. A. Davis**, manager of the midcontinent territory, has shifted his headquarters from Tulsa to Dallas.
- **James B. Porteus** has been elected president, director and chief executive officer of the Sterling Engine Co., Buffalo. He succeeds **Addison F. Vars**, who has been elected chairman of the board. **George M. Ebert**, formerly vice-president and controller, has been elected executive vice-president. Mr. Porteus had been with the Westinghouse Electric International Co. as regional director in charge of distribution in Brazil.
- **Jack F. Knobloch**, general superintendent of the Weatherhead Co. since 1941, has joined the production staff of Jack & Heintz Precision Industries, Inc., Cleveland, as superintendent of the ball bearing division.

• **Thomas P. Mandell**, 46, sales executive of the Carrier Corp., Syracuse, died Aug. 7.

• **George S. Hamilton**, 62, former president of the Hamilton Mfg. Co., Two Rivers, Wis., died recently.

• **Henry Sandmann**, 74, assistant manager of the scientific division of the American Optical Co., Buffalo, died Aug. 2. He had been with the company 45 years.

• **Frederic W. Willard**, 66, retired president of the Nassau Smelting & Refining Co., Inc., Tottenville, N. Y., Western Electric subsidiary, died Aug. 11.

...OBITUARY...

• **Louis E. Young**, 67, retired vice-president of the Pullman Standard Car Mfg. Co., Chicago, died Aug. 5.

• **Safford K. Colby**, 74, vice-president in charge of research and advertising for Aluminum Co. of America, Pittsburgh, died suddenly Aug. 4. He had been associated with the company for more than 51 years.

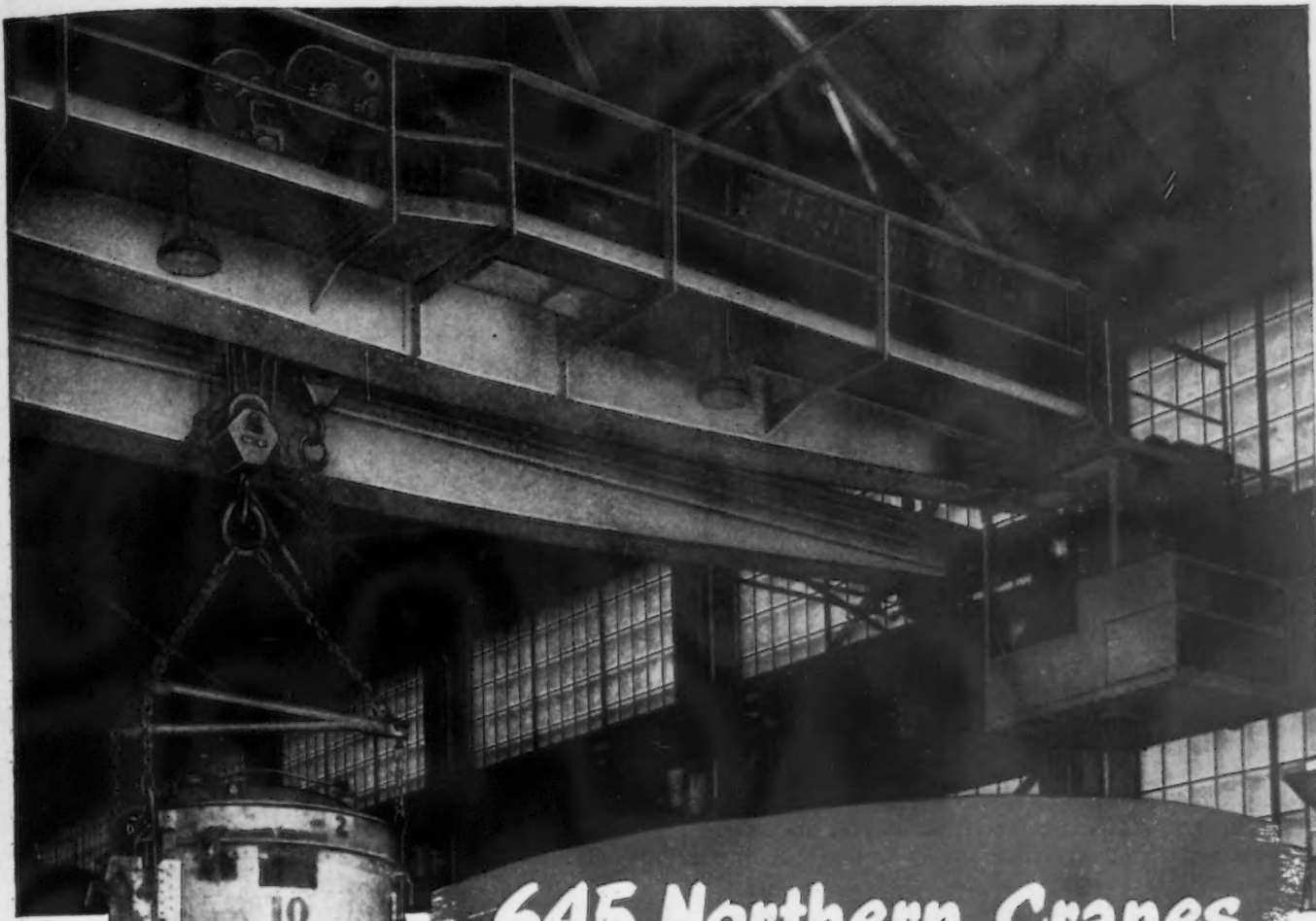
• **William P. Casey**, 56, president of the Casey Mfg. Co., Oshkosh, Wis., died Aug. 4 after a long illness.

• **Luther E. Roby**, president of Peoria Malleable Castings Co., Peoria, Ill., died July 30.

• **Charles E. Halloran**, 54, construction superintendent of the John W. Cowper Co., Inc., Buffalo, died Aug. 9. He was an engineer for the Bethlehem Steel Co. before joining the Cowper firm 13 years ago.

• **Melvin C. Mason**, 55, died recently. He was vice-president and secretary of the Houdaille Hershey Corp., Detroit.

• **Winfield S. Adams**, 51, Buffalo representative of Manning, Maxwell & Moore, Inc., for many years died Aug. 1.



645 Northern Cranes bought by a SINGLE Customer!

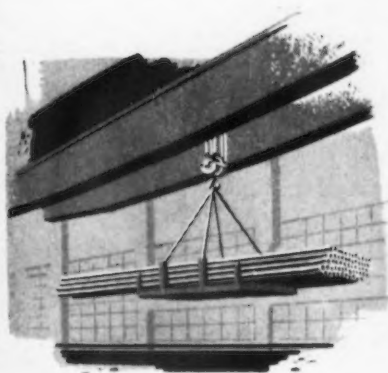
Placing scores of repeat orders over a period of years, one large company has bought a total of 645 Northern Cranes.

Only one conclusion can be drawn from this continuous repeat business—Northern produces cranes which give lasting satisfaction.

These orders have included cranes of every type—capacities 5 to 75 tons—and for every sort of service from powerhouse cranes to heavy duty high speed mill cranes.

This is the largest number of cranes we have sold any one customer; but many companies regularly place repeat orders for Northern Cranes and have large numbers of them in operation.

There is a Northern Crane to meet your needs. Write for Bulletin I 712.



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Industrial News Summary . . .

- **FTC Charges Conspiracy in Steel**
- **Attack Is on Multiple Basing Points**
- **Republic Ties Pig Iron to Scrap Prices**

THE Federal Trade Commission laid its heavy artillery on the steel industry this week and let fly with a mighty salvo on price conspiracy and multiple basing points. In Washington the roar was terrific. But at Pittsburgh, Chicago and intermediate points there were many dull thuds from shells that acute observers believe will prove duds. The attack was aimed at the multiple basing point system used in steel selling since 1924.

The issue was a trifle beclouded by charges of combination, conspiracy and price fixing as the FTC took advantage of recent price increases and wide publicity on steel shortages. Some observers believe arbitrary basing points and "phantom freight" (charges for theoretical, though unused, haulage) may not withstand the FTC attack.

But the bulwark of steel marketing, the multiple basing point system, will probably emerge bloody but unbowed. Those who have carefully watched the FTC pot shots in this 10-year old skirmish give at least three reasons why the multiple basing point system is expected to survive: (1) No one has conclusively proved that there is a better distribution method from the steel consumer's viewpoint, though it is not at its best when steel demand is abnormal; (2) the f.o.b. mill basis which FTC would substitute would seriously dislocate steel buying by favoring fabricators located near the steelmaking centers; (3) the latest Federal Court ruling (the Cement Industry Case, Sept. 20, 1946), was directed against the FTC and upheld the multiple basing point method of selling cement.

The smoke screen of charges that the American Iron & Steel Institute and its members are involved in fixing prices and extra charges remain to be proved. What evidence can be uncovered in the face of the institute's "hands-off-prices" policy is yet to be heard. At any rate the case will probably drag on for years and by that time the political complexion in Washington may have changed and the case dropped. That is, if a federal court doesn't rule against the Commission and lead it to drop the matter itself.

DURING the past week Republic Steel Corp., the country's third largest steel producer, tied its pig iron prices to THE IRON AGE No. 1 heavy melting steel scrap quotations at Cleveland and Buffalo respectively. Since scrap has been selling for more than the pig iron it replaced, Republic officials felt they could either stop selling pig iron or add to its price the additional cost of the metal it replaced.

Other pig iron producers have indicated interest in the idea, which Alan Wood Steel Co. has been using for basic iron in modified form for several months, but early this week no others had put it into effect. Because heavy melting steel scrap was selling for more than pig iron, THE IRON AGE reflected the average increases at Cleveland and Buffalo and advanced its pig

iron composite price to \$37.35 per gross ton, an 83¢ increase for the week.

The soaring scrap market which had steel producers worried during the past month has reversed its trend and fell even more this week than it did last week. These two breaks have wiped out all the increases made during the past month and materially increased the flow of scrap which was held in hopes of even higher prices. This week THE IRON AGE heavy melting steel scrap composite price dropped \$2.50 to a figure of \$37.92 per gross ton. This index is composed of average heavy melting steel scrap prices delivered at Pittsburgh, Chicago and Philadelphia, where the averages declined \$3.50, \$1.50, and \$2.50 respectively.

The steel ingot operating rate declined another half a point this week to a point where the industry was set up to operate at 93.5 pct of rated capacity. Much of the drop came in Chicago where hot weather plus the vacation schedule teamed up to cut the steel-making rate there. Vacations are cutting into available help in the steel mills more this summer and few companies are willing to pay double time for vacation work as they did during the war.

The slight decline in the steel operating rate over the past few weeks is not regarded as indicating any reduction in steel demand. Now that new higher prices have been in effect on steel products for several weeks the mills report no falling off in order volume. Steel producers indicate that pressure for delivery in many lines still continues strong and few cancellations or cutbacks are reported. Work on fourth quarter schedules indicates little change in allotments though many consumers are still being regularly disappointed in the amount of sheet steel they are getting.

THE increasingly important competitive position of aluminum is giving some steel sales executives cause to think. Recent announcements of major price cuts in aluminum products by Reynolds Metals and Kaiser came at a time when aluminum shortages are easing and deliveries improving. The aluminum industry is today producing virgin ingot at a rate three times its prewar peak and competition for the lucrative sheet business is expected in some quarters to cause the Aluminum Co. of America to meet its competitors' lower prices.

Reports that the United States is prepared to ship 600,000 tons of steel ingots to aid in rebuilding the Ruhr coal mines have led to speculation on the possible loss of 150,000 tons of this country's scarce scrap. Some arrangement, it is thought, might be worked out to return this scrap. However, a War Dept. spokesman declared that "no offer of American steel in any amount has been made," adding that the discussions are still in the exploratory stage.

• **ORE SHIPMENTS**—Preliminary reports indicate that up to Aug. 11, 43,250,000 gross tons of iron ore had been brought down the Lakes from all ports, or about 2,800,000 gross tons a week. Qualified observers believe there is still time to make the estimated required tonnage of 85 million gross tons before close of navigation this fall. Present indications are that the total Lake movement will be about 82 million tons, and an all-rail movement of about 1,500,000 or 2,000,000 tons, making a total season's movement of 84 million tons. However, if consumption of Lake Superior district iron ore continues at the present rate through the winter, stocks will be well down by the opening of navigation next spring.

• **STEEL PAYROLL**—In the first six months of 1947 the wage and salary bill of the iron and steel industry totaled \$958,573,000, almost as large an amount as the total payroll in the entire year 1940, when approximately \$960,779,000 was paid to employees, the American Iron and Steel Institute announced recently. In the first half of last year wages and salaries totaled about \$690,000,000. The wage bill in June was estimated at \$167,625,000, approximately the same as in April but below the May total. The average hourly rate of pay for hourly piecework and tonnage employees in June was \$1.547, as compared with \$1.556 in May. The total number of employees in June was 622,600, including 531,600 wage earners, against total employment of 614,800 in May. Average hours worked by hourly, piecework and tonnage employees in June was 38.1 per week, against 39.1 in May.

• **JAPANESE STEEL**—From a peak capacity of 8,000,000 metric tons in 1943, Japanese steelmaking capacity has been limited by the Far Eastern Commission to 3,000,000 metric tons annually. Ferroalloy plants in Japan resumed operation on a small scale in 1946, with some partly converted to make calcium carbide from limestone for fertilizers, and others to produce salt from sea water for domestic consumption and fish packing. The majority of the ferroalloy plants are idle now because they are dependent upon the steel industry to consume the output and because of shortages of high-grade material.

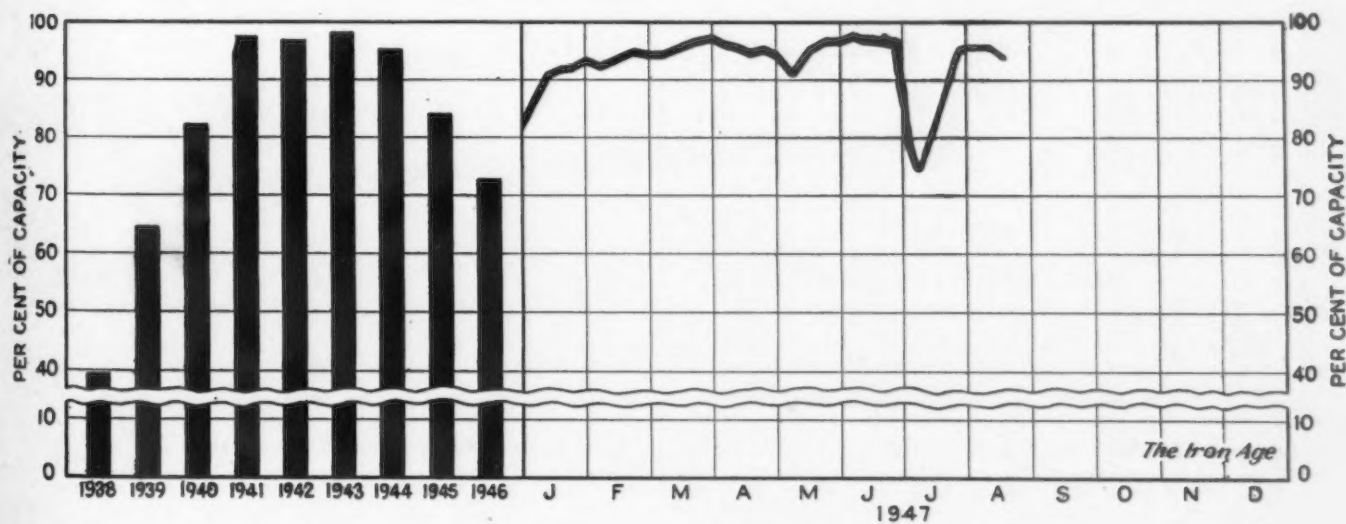
• **OLD HITS AT FTC**—"In our opinion," said Irving S. Olds, board chairman of U. S. Steel Corp., "the basing point charges . . . have no more basis in fact or in law than the similar unfounded accusations advanced by the Commission in our basing point hearings before the Temporary National Economic Committee in 1939 and 1940." Mr. Olds declared that the f.o.b. mill basis desired by the FTC as a substitute for present practices would lead to dislocation in the steel industry and chaotic conditions for steel consumers. He also foresaw the rise of local steel monopolies and higher assembly and steel production costs.

• **CONSTRUCTION HALTED**—Many construction projects planned by cities, counties and states all over the country are being abandoned. The largest single deterrent is not high costs but the escalator clauses which contractors, fabricators and erectors are including in their bids. Financial houses are refusing to lend money and float bonds on this basis. Construction companies have been forced to protect themselves via the escalator method and do not see any possibility of scrapping it until they are assured that material, labor and other costs are on a firm basis.

• **CANADIAN WIRE PRODUCTS**—Canadian production of steel wire and wire nails increased in June over the same month last year, but wire fencing output declined. Output of steel wire in June amounted to 25,658 tons, compared with 27,602 tons for May and 22,146 tons for June, 1946. Production for the first six months this year totalled 161,184 tons, compared with 137,526 tons in the like period of 1946. Production of wire fencing amounted to 1,952 tons for June against 2,367 tons in May and 2,138 tons in June, 1946. Output of wire nails during June was 6,220 tons compared with 6,669 tons in May and 5,686 tons in June, 1946. For the six months ended June 30, production of wire nails totalled 38,355 tons compared with 36,231 tons in the first half of 1946.

• **BENELUX SNAG**—Requests to Belgium for an exchange of information on industrial expansion between that country and the Netherlands as a part of the customs union now being negotiated have been refused. The problem of rationalizing industrial development in the two countries is considered fundamental to the growth of the new union, and new negotiations will be undertaken in the near future.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
August 12	100.0	94.0	89.5	95.0	99.0	102.0	85.0	99.0	98.0*	106.0	96.5	84.5	94.0	94.0
August 19	100.0	91.5	89.0	95.0	96.0	102.0	100.0	99.0	100.5	110.0	96.5	82.0	94.0	93.5

*Revised.



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Federal Trade Commission Blasts at Industry on Price Setup

New York

••• The Federal Trade Commission blasts at steel industry pricing methods may gain wide public support but its complaint may not stand up under a factual scrutiny, according to observers who have been watching FTC moves to force an f.o.b. mill system pricing on the steel industry for more than ten years.

There is nothing new in the latest militant move of the FTC according to steel sources. But it is admitted that the complaint is one of the biggest and best prepared since the government agency decided that the steel firms did not know how to sell their products. The fact that the FTC has missed the boat, so far, in its fight against the multiple basing point system when it attacked the cement industry may be, according to some sources, why the steel industry was chosen this time.

Observers point out that the public frame of mind on prices is being used by FTC to gain as much publicity as possible for its drive for an f.o.b. mill system on steel. It was no coincidence, it was argued, that the release of the blast occurred soon after the rise in the price of steel. Yet anyone who assumes that the steel market reflects "normal" conditions today is, according to steel officials, quite ignorant of steel market history. With demand still at an all time peak and with steel mills able to select their business as they choose it is obvious—according to steel observers—that competition would be desultory, prices mixed, and consumers willing to pay almost anything to get material. Steel sources privately deride the idea that there is no competition in the steel industry. They point to regular periods in the past when demand and supply were about equal or when supply was greater than demand to clinch their arguments. Then, price cutting was rampant.

A close scrutiny of the FTC charges, it is said, reveals that taking present conditions as normal constitutes the weakest part of the complaint. As to the charge that the American Iron and Steel Institute helps fix prices—that the FTC will have to prove. The institute has been notable in its insistence that it has nothing to do with steel prices even to the point of volun-

Suit Naming Steel Institute Is Blow At Basing Point Sales Price System

By TOM CAMPBELL
News-Markets Editor

teering no price information whatever nor answering any inquiries on prices.

But the main problem and the one on which the battle lines will form will involve highly technical and theoretical arguments on the entire multiple basing point system in the steel industry. That is what the FTC complaint is about. Had it not been for the war the grand assault

For U. S. Steel Corp. statement on the suit see p. 111.

would have been made about 1939, it has been said by steel sources. Some quarters believe that steel firms which charge so-called

phantom freight (charges not actually incurred) will be found vulnerable when hearings begin. Others say that in any case where charges are being made which are not supported by actual conditions will find the FTC guns heavily trained on them. On the general question of steel price policies it will be difficult if not impossible, according to old-time observers, for the FTC to impress upon a Federal Court the necessity to completely upset a basic industry in order to supplant a tried and historically tested pricing policy with one espoused by FTC and never tested in years. Sooner or later the steel companies knew they would have to present their side of the argument to the highest court in the land if the basic industry in the country were not to be broken up into local "steel monarchies."

The principles to be debated will be so fine that the entire multiple basing point system will be put under the most searching glare. But the FTC will also have a job of trying to prove that its method is better than that now followed and also that its insistence on an f.o.b. mill pricing system may not result in the old adage "the operation was a success but the patient died." There is grim humor in this type of retort.

To many steel officials the charge that there is no competition in the industry during normal times is laughable. These sources point to as recently as 1938 when the competition for business was so severe that it threatened to put the industry into price cutting chaos. All during the last part of 1937 and into the first half of 1938 steel firms were continually shading prices. At many other times in the industry's history this same pattern has developed, whether it occurs again or not does not, it is said, depend on the arguments advanced by FTC but on whether steel firms can afford to engage in a bitter price war when the costs of labor and materials remain where they are expected to stay (see THE IRON AGE, Aug. 14, p. 109).

The old, but dressed up in clothes, complaint of the FTC may find its way to the Supreme Court

On Basing Points

••• A decision rendered Sept. 20, 1946, by the U. S. Circuit Court of Appeals at Chicago set aside an FTC order issued against the multiple basing point system of marketing in the cement industry. The case has not yet been brought before the U. S. Supreme Court (THE IRON AGE, Oct. 3, 1946, p. 85).

In the fall of 1945 considerable interest was shown in the steel basing point system as the result of the so-called Corn Products Case in which the Supreme Court in effect ruled out the single basing point system but made no distinct reference to the legality of the multiple basing point system.

In the May 3, 1945, issue of THE IRON AGE, p. 74, is a discussion of the Corn Products Case which is credited with causing changes in the steel price system. The stainless steel basing point change was covered in the Sept. 13, 1945, issue, p. 99.

Other references pertaining to the steel industry may be found in the issue of Sept. 20, 1945, p. 109, and Sept. 27, 1945, p. 95.

An "ABC of Basing Point System" pertaining to steel appeared in THE IRON AGE, Oct. 4, 1945, p. 121.

and it is probably with a sigh of relief that steel companies see it on its way. The attacks by the FTC on the steel industry have been going on with gusto for more than ten years.

Under the multiple basing point system in normal steel markets the buyer in one major steel area can be sure that he will pay about the same price as his competitor in another. A steel buyer in Cleveland knows that the price to his competitor in Pittsburgh will be the same. Those who are located between basing points know that competition in the industry in actual practice will give them the price at the ruling (nearest) basing point plus the freight from there regardless of where the steel comes from.

Under the f.o.b. mill system a Cleveland user who was unable to get his steel in Cleveland or close by would have to pay the base price from another point plus the freight to Cleveland which would run his costs much higher than under the present system, it is claimed. This is a simple explanation but the FTC will, it is said, go much further and claim that users who are at a mid-point between basing points will have to pay more for their steel than those further away when the steel is being sold by the same company which is competing with another steel company basing point. Volumes will be written into briefs, court records and final answers, but the fact remains that on the basis of these voluminous writings will depend the future of the steel industry and its customers, and incidentally the future of the hoary FTC f.o.b. mill cure-all which it has held in its bulldog grip for years, defying any and all to dispute it.

Washington

••• In filing its complaint against the American Iron & Steel Institute and its members on Aug. 17, the Federal Trade Commission charged that the manner in which the steel industry uses the multiple basing point system results in "the same identity of delivered prices . . . as though the industry were operating under a single basing point system."

Specifically, the FTC complaint charges the American Iron & Steel Institute and its members with

engaging in a "wrongful and unlawful" combination and conspiracy to fix and maintain delivered price quotations and to restrain and destroy competition in the sale of iron and steel products. The complaint also charges the industry with agreeing on methods for determining extra charges.

Alleged violation of Section 5 of the FTC Act is the primary charge. As is customary in such cases, the respondents were given 20 days to file answers to the complaint. No date has been set for formal hearings.

FTC's action actually is a renewal of its old fight with the steel industry, soft-pedaled during the war. While FTC officials refused to comment beyond reference to their press statement, THE IRON AGE learned that there is no connection between this action and the steel investigation now underway in the agency's economic division.

While the complaint is directed generally against all members of the Institute, it specifically names as respondents 26 corporations as representative of the membership. These corporations, including nine principal producers and 17 subsidiaries, are:

U. S. Steel Corp., New York, and eight of its subsidiaries: American Steel and Wire Co., American Bridge Co., Carnegie-Illinois Steel Corp., National Tube Co., American Sheet & Tin Plate Co., Columbia Steel Co., Tennessee Coal, Iron & R.R. Co., and Virginia Bridge Co.

Bethlehem Steel Corp., New York, and three of its subsidiaries: Bethlehem Pacific Coast Steel Corp., Bethlehem Steel Co. of Pennsylvania, and Bethlehem Steel Co. of Delaware.

Republic Steel Corp., Cleveland, and two of its subsidiaries: Truscon Steel Co. and Fretz-Moon Tube Co.

National Steel Corp., Pittsburgh, and two of its subsidiaries: Weirton Steel Co. and Great Lakes Steel Corp.

Inland Steel Co., Chicago, and one of its subsidiaries: Milcor Steel Co.

Jones & Laughlin Steel Corp., Pittsburgh; American Rolling Mill Co., Middletown, Ohio, and Wheeling Steel Corp., Wheeling, W. Va.

The complaint traces the wide-

spread operations of the respondent producers and alleges that except for their activities pursuant to the alleged conspiracy they "would be in active and actual competition with each other as to price and as to matters directly and substantially affecting prices."

On the contrary, however, the complaint charges that for many years they have "collectively composed, published and announced prices" and "systematically exchanged and interchanged information among themselves calculated to enable them to formulate and carry out a common non-competitive price policy."

To the extent that the producers "act collectively and collusively in the production and pricing of their goods, they are in a position to frustrate and destroy price competition among themselves and thereby to nominate and manipulate the markets in which their unorganized customers and consumers must buy such goods," the complaint sets forth, adding:

"The producer-respondents have exercised that domination and power to control and manipulate the market collectively through the offices of the American Iron & Steel Institute. That fact is evidenced by action taken in connection with the increase in steel prices which was announced during July 1947. Producer-respondents collectively supported that increase through the offices of the Institute. Representatives of producer-respondents have announced that the increase aggregated hundreds of millions of dollars."

Describing the present multiple basing point system used by the respondents, the complaints charge that its operation according to plan insures that "the same identity of delivered prices will result as though the industry were operating under a single basing point system" and "as though all mills were under one ownership and control."

"Inherent effects" of the collusive practices of the respondents are stated to include "substantial lessening of competition" and "unfair and oppressive discrimi-

[CONTINUED ON PAGE 137]

Republic Ties Basic Pig Iron Prices To Scrap

Cleveland

••• Because of pyramiding iron and steel scrap prices, Republic Steel Corp. announced last week that all basic iron will be invoiced at a base price corresponding to the average price of No. 1 heavy melting scrap f.o.b. Cleveland and Buffalo, respectively, as shown in THE IRON AGE. The new method of selling pig iron was effective Aug. 13, 1947.

Foundry and malleable grades will be invoiced at existing differentials over basic iron and all established extras will apply on all grades.

Prices determined by this procedure will apply on all shipments of pig iron for the week commencing at 12.01 a. m. on Monday following such publication.

This procedure will apply whenever the published prices of No. 1 heavy melting scrap at Buffalo and Cleveland are in excess of the Buffalo and Cleveland basing point prices of pig iron as shown in THE IRON AGE under the heading "Pig Iron Prices" (example—p. 139 of the Aug. 7, 1947, issue).

The Republic announcement states that "under present conditions it is necessary to replace through the purchase of steel scrap the metallics lost through the sale of basic, foundry, or malleable pig iron from the blast furnaces which we are operating at Buffalo and Cleveland.

"Pyramiding prices of iron and steel scrap have caused us a great deal of concern in recent months. We have come to the point where we feel that we can no longer afford to sell the pig iron from our blast furnaces and replace this tonnage with scrap which costs several dollars more a ton than the price of the pig iron we sell.

"There are two alternatives. One is to discontinue entirely the sale of any merchant pig iron. The other is to sell it at a price commensurate with the prices paid for scrap to replace it.

"Realizing that the first of these two alternatives would cause a great deal of disruption, Republic Steel Corp. has decided to institute the following policy

Unruly Scrap Market Prompts Firm to Protect Self As Price Ranges Shift

effective with shipments Aug. 13, 1947:

"We will continue to produce and ship merchant pig iron and will invoice all basic iron at a price corresponding to the average price of No. 1 heavy melting scrap f.o.b. Cleveland and Buffalo, respectively, as shown in the magazine THE IRON AGE under the heading "Iron and Steel Scrap Prices" (example—p. 133 of the Aug. 7, 1947, issue). The foundry and malleable grades will be invoiced at existing differentials over basic iron. All established

extras will apply on all grades."

Republic Steel Corp. has announced an increase of \$3 per ton on pig iron produced at Birmingham.

Chicago

••• Republic Steel's new system of selling pig iron has for the first time directly tied the price of this item to that of scrap. Thus, the steel making material, which in normal times was of minor importance, has again inched further toward dominating the entire industry. Bred by scarcity, plus a somewhat unrealistic approach to the problem by steel producers, the scrap shortage observers here believe, may force other steel producers to adopt Republic's system. It is not believed that the merchant iron makers will follow, simply because the making of iron

"Whither thou goest . . ."



constitutes their entire business.

Effective Aug. 13, the Republic Steel Corp. started to sell basic pig iron at the average weekly price of No. 1 heavy melting scrap as quoted in THE IRON AGE, in both the Cleveland and Buffalo districts. The foundry grades are also based on the scrap price with the existing differentials to apply. Established extras for silicon and manganese will be charged in addition, as was the former practice.

Reactions from iron consumers have been somewhat mixed, but on the whole the foundries do not like the new system and fervently hope it is not adopted by other steel producers. The steel companies in this area last week, on first hearing of the new method of pricing, generally expressed the opinion that "it is a good idea." Most of the midwestern foundries contacted by THE IRON AGE chorused, "it's screwy," and in between opinions varied.

For some time the steel producers have been faced with the problem of deciding whether or not they should sell iron, be it basic iron to another steel company who has no blast furnace, or foundry grades to the casting industry. Every ton of hot metal not reaching their own open hearth has had to be replaced by scrap. With scrap in short supply and therefore continually rising in price, steel producers have been sorely tempted to keep all the iron they make and thereby preclude having to buy as much scrap. The

decision reached by Republic, observers here declare, can be justified solely on scrap prices. If this mill were to continue to sell iron, most of which they themselves need desperately, their only recourse would be to charge the same for the iron as they would have to pay for the scrap needed to replace the hot metal in the steel making furnace.

The foundries are not quite in agreement. They have admitted that even under this system, pig iron at present will not cost as much as good cast scrap, but that the steel companies need not go to so much trouble to maintain profit operations on a product whose sale amounts to so little of their total business volume or income. One executive of a large iron foundry in Chicago pointed out that the pig iron price in Cleveland and Buffalo will now fluctuate with that of scrap, which means a different price almost every week. This observer declared that the clerical help and paper work will become so involved that he doubted the system would be retained very long.

A large foundry in Michigan informed THE IRON AGE that the system might not be too bad if through such a method more iron was made available. This foundry buys steel scrap, cut 3 ft and under, for its electric furnaces at about \$5 over the No. 1 heavy melting grade. Iron of consistent chemistry and size would not be over priced, therefore, this com-

pany believes, if tied to the cost of No. 1 heavy melting scrap.

Although most of the foundries stated they usually buy entirely from merchant furnaces, they have been somewhat dependent on iron from the blast furnaces of the steel producers since the war. Last week the merchant furnace companies were of the opinion that they would not change their system and sell their output on Republic's basis. This could produce a dual price on iron in some districts, which market men say would make it difficult for the selling organizations who handle iron from both sources.

All in all the reaction in Chicago by consumers was that they hope the new method dies a quick and unnatural death. All the foundries said that should they be forced to buy iron on this basis, even to a limited extent, the cost of their castings would have to be increased. They did not, however, believe that just because the iron price would fluctuate with that of scrap that they would be forced to vary the price of their castings, or be forced to synchronize the product price with the raw material cost.

Scrap interests are not in favor of the policy. No one would predict that the new method will either cause scrap prices to go higher or lower. Most scrap men here do not believe that the system will stabilize scrap prices and further, they dislike the fact that now they may have another variable in an already chaotic market. Brokers point out that if under the new system, the mills plan to sell more iron than they have in the past to the foundries, the cast scrap prices may come down. If such were the case the overall cost of raw material to the foundries might not increase.

The week closed with much uncertainty on what the future will bring. Some believe that should all steel producers adopt Republic's system, the scrap-to-product cycle will become an uncontrollable vicious circle. Those who disagree with this theory still admit that it would be difficult to determine and evaluate the factors affecting the market, as which came first the chicken or the scrap price has always defied precise definition and may now pass beyond all hope of settlement.

SEAGOING BARGAINS: *Seven hundred boats at the bargain rate of \$750 per each. That is the good word from the Navy boat pool at San Pedro, Calif. They include air-sea rescue craft, landing craft, motor launches and officers' motorboats, all now up for sale as surplus.*



Competition Forces Sheet Aluminum Price Reductions

New York

••• Recent announcements of major price reductions in sheet aluminum specialties by two producers have served to highlight the competitive nature of the aluminum field since the entry on an integrated basis during the war of Reynolds and Kaiser. The Aluminum Co. of America, producer of 50 pct of the country's sheet aluminum tonnage, has not yet taken action to meet its competitors' lower price schedules on these specialties.

Since 1939, price reductions by Alcoa on aluminum ingots and finished aluminum products have been significant in the face of an estimated 75 pct increase in wage rates during that time. The present high rate of consumption of aluminum products is due in part to the lower prices now in effect for fabricated products. Other factors include the long sustained shortages of steel products and other metals, the development of many new aluminum alloys which have broadened the usefulness of the metal to meet the requirements of new applications, and the war-developed techniques for fabricating aluminum and its alloys.

The production of virgin aluminum by the industry is approximately three times the peak pre-war output. Until the last few months, however, the shortage of aluminum ingots and finished products was so acute that delivery time on major products such as sheet, extruded products and aluminum cable-steel reinforced ranged from 6 months to a year. The shortage of ingots was such as to require major producers to import semi-finished aluminum products from Canada in heavy tonnages.

Competition in the last few months for the important sheet aluminum field has brought forth recent announcements from all producers of new specialized or general utility sheet products designed to place them in a good competitive market position. Two of these announcements have been coupled with price reductions. Consumers of sheet products have expressed the opinion that Alcoa

Price Cuts Since 1939 Expand Market for Ingots And Finished Products

By JOHN ANTHONY
Eastern Regional Editor.

cannot long defer the necessity for meeting these competitive prices.

The reduction in the price of ingots from 20¢ to 15¢ per lb since 1939 is well known by consumers. The price of this product is of interest primarily to foundries and for the past 2 years a product identified as aluminum pig has been available to them at 14¢ per lb.

Price reductions on fabricated aluminum products are perhaps of broader interest to the metal-working field and in most products between 1939 and the present have been appreciable. There have been some products that have been increased in price since 1939 but in most instances these are specialty items that do not represent large tonnage.

In flat sheet, price reductions since 1939 range from 9 pct to 28 pct. In coiled sheet, price reductions range from 15 pct to 25 pct. Plate reductions are from 18 to 28 pct. Coiled foil reductions during that time have been from 1 pct to 15 pct. Lacquered coiled foil has increased in price in some gages but decreases have been made in the heavier gages.

Extruded shape price reductions from 1939 have ranged between 2 pct and 18 pct. However, there have been minor price increases in the lower factor numbers for 3-S aluminum. Tubing prices in general have been increased since 1939. However, in the 24ST alloy there have been very significant price decreases.

Wire, rod, bar and rolled structural shape price decreases since 1939 range from 3 pct to 19 pct.

In the present competitive market for aluminum products, all domestic producers are nervously eyeing the activities of foreign producers and fear their early entry into the domestic market in order to obtain dollars.

In normal prewar years, foreign producers were estimated to have taken about 10 pct of the domestic market from Alcoa.

SHEET PRODUCTION EXCEEDS DEMAND: Aluminum sheet produced on a continuous mill at the Alcoa, Tenn., plant of Aluminum Co. of America. From a hot-rolled slab $\frac{1}{4}$ to $\frac{3}{4}$ in. thick, aluminum is reduced in one operation to sheet gaging 0.10 to 0.20 in.



Steelmaking Capacity Argued but CIO Unions Are Not Represented

Washington

••• Debate as to whether or not the United States should expand its present steel-making capacity finally reached the stage of international discussion this week.

The Iron and Steel Committee of the International Labor Organization, meeting in Stockholm has before it this ILO recommendation:

"A study of full employment patterns in the United States suggests that if full employment is to be maintained, the present steel-making capacity of the country will need to be expanded in order to supply the necessary materials."

Eleven U. S. representatives will vote next week on acceptance or rejection of policy resolutions drawn by ILO. While resolutions adopted by the Iron and Steel Committee are not necessarily binding upon

Following its policy of boycotting ILO meetings, the CIO steelworkers and auto workers unions are not represented at the meeting. The CIO is holding out for equal representation with the AF of L.
—Editor.

participating nations (THE IRON AGE, Aug. 7, p. 141), ILO feels that the publicity consequent to the Stockholm discussions unofficially will force action of some sort.

Topics of discussion similar to those before the Iron and Steel Committee will be taken up by the Metal Trades Committee when that

group meets in Stockholm on Sept. 3. Citing a U. S. Dept. of Labor study, "Full Employment Patterns, 1950," ILO points out that estimates of steel production needed to support full employment in 1950 vary from 97.7-120.1 million short tons.

"Whether or not any such demands will in fact be placed upon the steel industry is, of course, exceedingly problematical," ILO says, adding that "it may be far too much to hope for under present and immediately prospective peacetime conditions."

Discounting contemporary views that industry-wide adoption of guaranteed wage programs would lead to a reduction in total employment, ILO takes the view that it is "reasonable" to suppose that "the effects of guaranteed wage plans would at least tend to promote stability and economic expansion, particularly if used in conjunction with other measures designed towards the same end."

The wage plans, ILO says, "may bring about a redistribution of income and of the allocation of scarce resources among alternative uses through their possible effects on the total remuneration of the workers concerned, on the profits of entrepreneurs, and on the prices paid by consumers for the products of the industries operating such plans."

Summing up its arguments for guaranteed annual wage plans in the steel industry, ILO says there should be "some scope for a guaranteed annual wage, independently

of what measures may be taken to stabilize the level of employment in the economy as a whole."

What ILO is seeking here is the establishment of guaranteed annual wage plans in order to derive actual experience of the operation of such plans in representative steel plants in different countries. "In view of the great potential value of an annual wage to the industry as a whole and to the community, it would seem reasonable for any additional costs involved in the operation of experimental guarantee plans to be borne jointly by the industry and the government."

As for the Metal Trades Committee, scheduled to meet in Stockholm next month, ILO proposes adoption of similar resolutions.

Regularization of the automobile industry, for example, is a key problem, ILO points out, because of the plethora of related industries dependent on the basic automobile industry. Special consideration must be given the automobile industry, ILO says, because production has from the beginning been characterized "by notable fluctuations of both a cyclical and seasonal nature."

Representing the U. S. Government at the Iron and Steel Committee meeting are W. Thacher Winslow, of the Labor Dept., and Robert M. Weidenhammer, of the Commerce Dept., delegates; Victor S. Baril, of the Labor Dept., and Francis L. Spalding, of the U. S. Legation in Stockholm, advisers.

Representing employers are C. H. Murray, of Armco, and George T. Fonda, of Weirton, delegates.

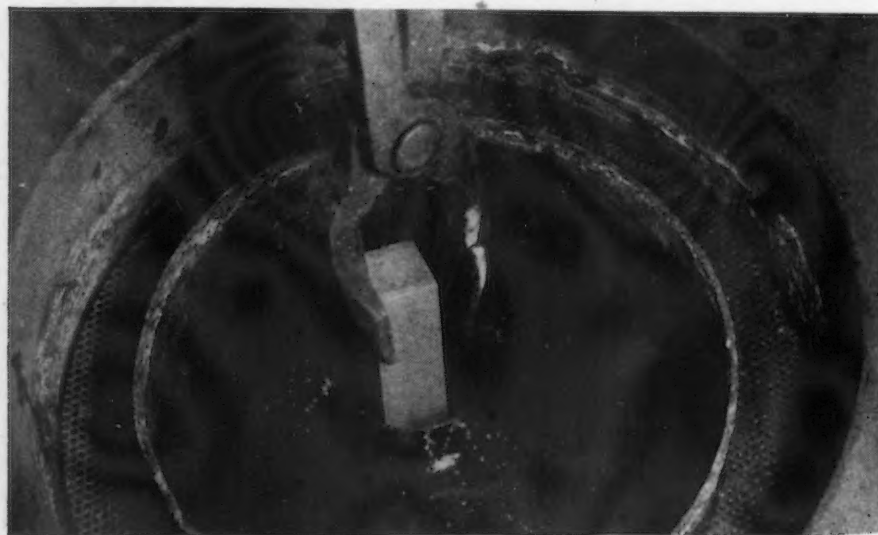
Representing the employees are Alex J. Dever, of Federal Labor Union 18887, and Clarence A. Seefeld, of Federal Labor Union 19806, delegates.

The Metal Trades Committee will be attended by Messrs. Winslow and Weidenhammer as delegates representing the U. S. Government.

Representing employers will be George Romney, of the Automobile Manufacturers Association, and A. M. Rochlen, of Douglas Aircraft Co., Inc.

Employees will be represented by Homer Patton, of the International Brotherhood of Boilermakers, Iron Ship Builders and Helpers of America, and B. A. Gritta, of the Sheet Metal Workers' Union, both delegates.

PUNCHING HOLE IN WATER: This unretouched photograph of the experimental quenching of a steel bar was made in the research laboratory of U. S. Steel Corp. (Del.) at 1/10,000-sec. exposure. The "hole" which is filled with invisible water vapor doesn't last long enough for the naked eye to catch it.



Weekly Gallup Polls . . .

Weight of Opinion Disapproves Taft-Hartley Law

Princeton, N. J.

••• A comprehensive survey of public opinion to date on the controversial Taft-Hartley Act reveals the following significant fact, according to George Gallup, director, American Institute of Public Opinion.

(1) Labor leaders were outstandingly successful in their efforts to persuade the public that the Taft-Hartley Act is a dangerous and harmful piece of legislation. Their constant reiteration of the phrase "slave labor law" coupled with the President's ringing veto message, evidently had a marked effect on a public which has long favored union curbing. As a result, among voters who have heard or read about the act, the weight of opinion is opposed to it.

(2) Yet—and this is the paradox of the situation—the major proportion of the voting population favors many of the specific reforms in industrial relations which the act attempts to bring about.

The public has long favored curbing such things as feather-bedding, closed shop and jurisdictional strikes. Also it has approved the idea of mandatory financial reports by unions and of "cooling off" periods before strikes. Advocates of the Taft-Hartley Act can find comfort in the fact that while the public's overall impression of the act is mixed, attempts to repeal or revise specific provisions may not prove at all popular.

(3) One revealing fact is that many people have opinions about the Taft-Hartley Act without knowing very much about what is in it. When asked to name specific things in the act, which they like or dislike, by far the greatest number could not think of anything.

Apparently voters have to a large extent been judging the act by what people say about it, rather than by what they themselves know about it. This again is evidence of the effective job which labor leaders have done in tagging the act with names and making those tags stick.

(4) In spite of all the discussion of the act, nearly four voters out of

every ten say they have not heard or read about it. This situation may change however as the presidential election campaign warms up.

(5) Opinion on the act splits sharply along partisan lines, a fact which increases the likelihood of its becoming an issue in next year's campaign.

Among Democrats who have heard or read about the act, three disapprove of it for every one who approves; among Republicans, it is just the other way around, with a vote of approximately 3-to-1 in approval.

The institute's survey was designed to measure public sentiment both qualitatively and quantitatively on the Taft-Hartley Act. The questions probed attitudes on many aspects of the issue.

Some of these questions follow.

"Have you heard or read about the Taft-Hartley law which deals with labor unions?"

	Pct
Yes	61
No	39

Those who had heard or read about it were asked the following questions:

"What is your opinion of this law?"

	Pct
Approve	33
Disapprove	39
Qualified and no opinion	28

Vote by Parties

	Democrats	Republicans
	Pct	Pct
Approve	17	53
Disapprove	52	22
Qualified and No opinion	31	25

"Can you recall specific provisions or points in the law which you think are particularly good?"

	Pct
No	75
Eliminates closed shop	9
Mediation before strikes	8
Outlaws jurisdictional strikes	4
Accounting of union funds	3
Other	5

"Can you recall specific provisions or points in the law which you think are particularly poor?"

	Pct
No	85
Eliminates closed shop	6
Curbs right to strike	6
Curbs union political rights	3
Other	2

Unions Winning Support For Revision of Act Although Many Approve Its Principal Points

o o o

The last two tables add to more than 100 pct because some named more than one thing.

••• There is a remarkable parallel between the voting public's attitude toward the omnibus Taft-Hartley Act to regulate labor unions and its attitude toward another omnibus law which for years regulated employers—the Wagner Labor Act.

The Wagner Act was never accepted by the public. Five institute polls conducted between 1939 and 1947 never once found a majority of voters familiar with the act wanting to see it left unchanged. Always, the weight of opinion was in favor of either revision or repeal. Most voters with opinions felt that it was a one-sided law—unfair to employers.

Today an institute survey finds the public taking the same kind of attitude toward the Taft-Hartley Act. Among those who have heard or read about the new law, the weight of opinion is in favor of repeal or revision, chiefly on the grounds that it is a one-sided act unfair to unions.

This is eloquent evidence of how effective was the campaign of labor union leaders to tag the act in the public mind as insidious and harmful, although it is widely known that the public favors many individual sections of the act such as the regulation of the closed shop, featherbedding, jurisdictional strikes and the requirement of financial accounting by unions.

••• American voters have mixed feelings about whether the Taft-Hartley Act should have been passed, and they are not at all sure that it will result in fewer strikes.

(CONTINUED ON PAGE 136)

Offers Cash Awards For Best Articles On Furnaces, Ovens, Kilns

New York

• • • The Industrial Furnace Manufacturers Assn. is sponsoring the "IFMA Prize Contest" to promote the publication of more and better articles in the trade press describing the economic advantages obtained by the use of modern industrial furnaces, kilns, and ovens. Papers published between Oct. 1, 1947 and Sept. 1, 1948 will be eligible for the prizes.

The articles may be the original or they may be technical society papers subsequently published in trade or technical papers IFMA says. Competition in the contest is open to all individuals or groups with the single exception that they must not be connected with the industrial furnace, kiln, or oven industry.

The papers will be judged as follows:

(a) Completeness and accuracy of operating data such as fuel or electricity costs, labor costs, floor space requirements, savings in preceding or subsequent operations, material costs, etc.

(b) Concise and complete coverage of improvements in the product,

such as physical qualities, appearance, the reduction of rejects or rework, etc.

(c) Clearness and completeness of description of equipment including size, construction, operating cycle, etc.

(d) Uniqueness of design with regard to method of operation, material handling, heating, etc.

(e) Completeness of description of parts treated, size, material, rate of production, etc.

(f) In general, the ability for a possible user in the same or similar industry to apply these data to his product or operations, and to determine the possible advantages from his use of the equipment or process.

The awards will be: First prize, \$1,000; second prize, \$300; third prize, \$200. In addition special non-cash awards will be made to the magazines publishing the three winning awards.

Carbon Steel Tubes Up

Pittsburgh

• • • Babcock & Wilcox Tube Co., Beaver Falls, Pa., announced the increase on price of seamless carbon steel tubing of from 4 to 10 pct, effective on shipments on and after Aug. 1. The average amount of this increase is approximately

7.5 pct. On shipments of welded carbon steel tubing on and after Aug. 6, the company announced price increases of about 7.5 to 8 pct.

Raise Alloy Bars, Tubing

Canton, Ohio

• • • The Steel and Tube Div. of the Timken Roller Bearing Co. has announced a price increase on alloy steel bars and seamless tubing effective on shipments starting Aug. 18. The increase amounts to \$5.00 per ton on hot-rolled and \$6.00 per ton on cold-finished alloy steel bars. The price of bearing quality alloy steel mechanical tubing has been increased 5 pct, with increases ranging from 4 to 10 pct on other grades of mechanical and pressure tubing.

Iron Powder Producer Suspends Production

Elizabeth, N. J.

• • • Metals Disintegrating Co., here, has determined to withdraw from the production and sale of commercial iron powders, effective Sept. 1.

The company, whose other products include reduced copper powders, nickel powder and silicon powder, has long planned to expand its production of commercial iron powders to larger tonnages so as to reduce its unit costs and place its production on a more competitive basis with the lower cost Swedish iron powder imports. In surveying the current market demand for commercial iron powders, the company has concluded that a mass market which would justify the required expenditure for greater production does not exist now.

Metals Disintegrating Co. expects to return to the production of iron powders when market conditions will absorb larger tonnages at lower prices, according to Harold E. Hall, president.

To Convert Lathe Plant

Washington

• • • A surplus engine lathe and boring plant at Saginaw, Mich., will be converted to production of heating boilers by the Wickes Boiler Co., the wartime operator. Sales price amounted to \$110,000.

Coming Events

- Aug. 22-23 Institute of Scrap Iron & Steel, midyear meeting, French Lick, Ind.
- Aug. 25-29 National Assn. of Power Engineers, Inc., Boston.
- Sept. 1-4 American Society of Mechanical Engineers, fall meeting, Salt Lake City.
- Sept. 8-12 Instrument Society of America, conference, Chicago.
- Sept. 10-12 Porcelain Enamel Institute, ninth annual forum, Columbus, Ohio.
- Sept. 17-26 National Machine Tool Builders' Assn., machine tool show, Dodge-Chicago Plant, Chicago.
- Sept. 18-20 Foundry Equipment Manufacturers Assn., annual meeting, Hot Springs, Va.
- Sept. 18-20 National Assn. of Foremen, annual convention, Los Angeles.
- Sept. 22-25 Assn. of Iron & Steel Engineers, annual meeting, Pittsburgh.
- Oct. 2-3 Gray Iron Founders' Society, annual convention, Milwaukee.
- Oct. 6-7 Packaging Machinery Manufacturers Institute, annual meeting, Springfield, Mass.
- Oct. 6-8 American Gas Assn., annual convention, Cleveland.
- Oct. 9-10 Porcelain Enamel Institute, annual meeting, Cleveland.
- Oct. 16-17 National Conference on Industrial Hydraulics (formerly Hydraulics Machinery Conference), annual meeting, Chicago.
- Oct. 18-24 National Metal Exposition, Chicago.
- Oct. 30-Nov. 1 American Society of Tool Engineers, semiannual meeting, Boston.
- Oct. 31 Illinois Mining Institute, annual meeting, Springfield, Ill.
- Nov. 7-8 Annual Conference on X-Ray and Electron Diffraction, Mellon Institute of Industrial Research, Pittsburgh.

How Fast Can You Clean A Steel Pop Bottle?



Unretouched photograph
courtesy Spacarb, Inc.

Used in coin-operated soda dispensers, these carbonating cylinders are made of stainless steel tubing. The darker of the two has been blackened by welding and silver soldering during fabrication.

Cleaning this cylinder, especially the inside, is a tough, tedious job—unless you use a pickling solution. Dozens of solutions were tried, however, without success—etching reaction made the tube surface unacceptable to Health authorities.

At the suggestion of Frasse, another solution was tried—with the result shown in the picture. Entirely satisfactory in surface finish, the tube is now cleaned at a saving of one hour and fifty minutes per unit.

Frassé makes no pickling solutions (although we'll send details for making this one on request)—but if you use tubing, and like qualified engineering service in its application, you'll find Frassé a good source to standardize on. Alloy, stainless and straight carbon inventories in a wide range of sizes and types for every commercial use. Call us.

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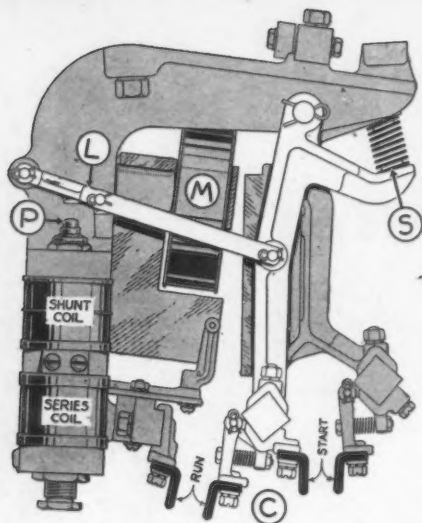
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Standard (Semi-Dust-tight) Enclosure →

For reduced voltage starting of 220-550 volt squirrel-cage motors these EC&M auto-transformer starters have a reputation for low up-keep cost throughout industry.

As illustrated above, the mechanism is a single, quick-break, double-throw Contactor (C), operated by a single Magnet (M), a throw-over Spring (S) and a mechanical Latch (L), tripped by plunger (P) which is raised by a current-limit relay to cause transition from reduced voltage starting to full voltage running.

Arranged for wall mounting with contactor oil-immersed in removable tank, the auto-transformers and thermal Overload Relays are mounted in the upper part of the case. Unlike conventional thermal relays, this device is of the hot-wire expansion type. It is set to trip at a low value of current above normal full load motor current for accurate overload protection. This can be done without false tripping during the starting period, because the wire is protected from high starting currents by current transformers.

Bulletin 1045-B gives complete ratings and dimensions and also lists three larger sizes of starters for 220-550 volt motors. Write for your copy.



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War Secretary Royall Calls for Industrial Mobilization Planning

Washington

• • • Peacetime plans for industrial mobilization and procurement must be energetically pushed by a capable Government planning staff if the United States is to meet any future national emergency squarely, according to Secretary of War Kenneth Royall.

"We will not have time on our side in any future conflicts," Mr. Royall said in his final report as Under Secretary of War from July 1, 1945, to June 30, 1947. "We must keep our sights continually adjusted to new factors as they arise."

To this end, the War Dept. currently is spending about \$25 million a year to maintain 60 government-owned plants in standby condition. These plants, Mr. Royall explains, are of a specialized nature and are considered vital to national defense in the event of another emergency. Maximum leasing of these plants to industry will cut the maintenance bill to \$10 to \$15 million, the War Dept. estimates.

In addition to these 60 standby plants leased to industry, the War Dept. is now working with War Assets Administration to sell or lease 71 other plants subject to repossession by the War Dept. on 120 days' notice. Lessees or buyers would be required to keep the plants in condition to resume war production on short notice.

Meanwhile, the Munitions Board is assisting the Army and Navy in selecting standby plants. Mr. Royall points out that the board is starting on its own program of advising the nation's principal manufacturers of the probable uses to which their plants may be put by the Government in the event of a future war. This program will continue for several years.

An industrial mobilization plan for 1947 is now being prepared by the board and present plans call for keeping the plan up to date each year. The War Dept. is continuing the investigation of European industrial mobilization plans started earlier this year by Richard R. Deupree, Proctor & Gamble, former chief and chairman of the Munitions Board.

Old Open Pit Ore Mine And Foundry Are Sold

Washington

• • • An open pit iron mine, once operated by the late Andrew Carnegie, and a steel foundry will be transferred from government ownership to private hands for a total sum of \$395,000, it is announced by WAA.

The mine, near Scotia, Pa., was opened and developed by Mr. Carnegie in 1883 but abandoned in 1900 as unprofitable. Upon the advent of World War II, the government acquired the property and leased it to the Butler Bros.

It was operated only a limited time during the war. The new owner, Peter M. Chamberlain, Jacksonville, Tex., will install new operational methods at the mine which was acquired for a price of \$170,000, including the ore reduction plant, but will not go into large scale production until sometime in 1948.

Omaha Steel Works, Omaha, Neb., has bought for \$225,000 the government-owned steel foundry in that city which it operated during the war. It has little competition in the area in the form of other foundries. It has a capacity of 4000 tons of steel casting per year.

Steel Workers' Chorus Sings at Chautauqua

Youngstown

• • • More than 50 steel workers will present two concerts before the Chautauqua Association at Chautauqua, N. Y., Saturday and Sunday, Aug. 23 and 24.

A special invitation was received by Youngstown Sheet & Tube Co. Male Chorus to appear on the summer program as a result of their appearance at a Welsh eisteddfod at Warren, Ohio, early this year.

The adjudicator at the eisteddfod was Dr. Walter Howe, head of choral music at Chautauqua, who said: "That is the finest male chorus I have ever listened to."

The chorus, composed almost entirely of steel workers from all departments of the company in Youngstown, was organized 10 years ago by Alf Williams, a steelworker.



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LIONITE representatives have had wide experience in all phases of metal polishing. They are at your service to survey your polishing procedure and submit recommendations. There is no obligation. If you are not entirely satisfied with costs or quality in your polishing department, ask to have a LIONITE representative call.

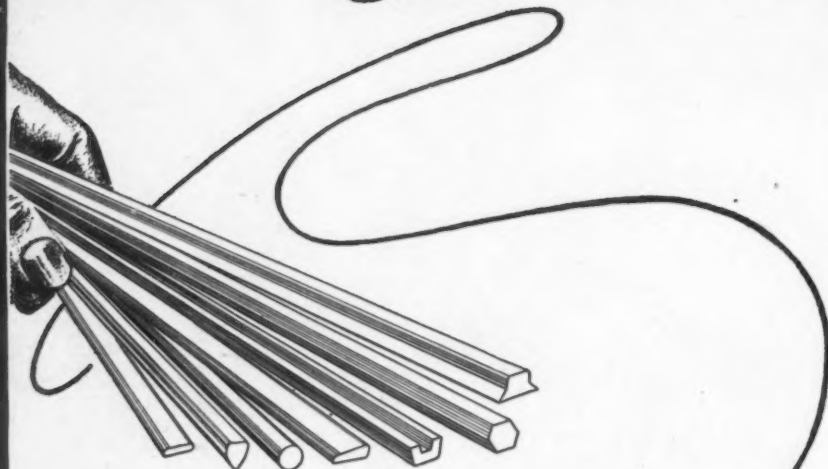
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Sponge Iron Process Said to Be Ready For Possible Emergencies

Washington

••• **Sponge iron** produced by the Bureau of Mines in pilot plants has proved a worthy substitute for scrap and has been used successfully in the production of a high-quality steel suitable for the manufacture of tool and cutlery instruments, according to a new publication summarizing Bureau research in this metallurgical field. In any emergency, sponge iron could be put into production almost immediately, using available equipment, such as brick plants or cement kilns, Acting Director Thos. H. Miller said in releasing the report.

Successfully producing a scrap substitute, the Bureau found that iron-ore deposits too small to warrant the construction of an expensive blast furnace or not near enough to coking coals to be economically usable could be processed into sponge iron at small brick plants, the report states. Not only adding to national reserves, these ores could be used to conserve dwindling high-grade iron ores from the Mesabi range and elsewhere. Furthermore, sponge iron could be produced without using coking coals and on a smaller scale than would be economical in blast furnaces.

High-grade sponge iron proved unusually effective in producing tool steels in basic electric furnaces, according to the report. When used with scrap containing contaminating elements such as lead, copper, tin, and zinc, the sponge iron improved the quality of the product due to the fact that it contained little or none of them. Because high-grade sponge iron imparts desirable qualities to steel, tool manufacturers might be interested in its commercial production on a small scale, even if costs were higher than for high-grade scrap, the publication states.

Prepared by R. C. Buehl, M. B. Royer, and J. O. Riott, Bureau metallurgists with the Metallurgy of Steel Section, Central Experiment Station, Pittsburgh, Pa., the long report includes detailed information on tests conducted at each steel plant.



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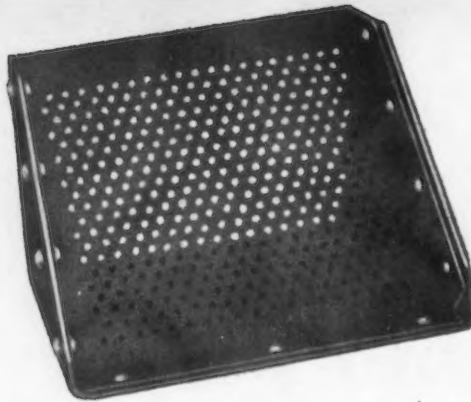
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elevator bucket illustrated is typical of the many specialized articles for whose fabrication Hendrick has unusual facilities.

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Baldwin Nets \$1,536,093

Philadelphia

••• The Baldwin Locomotive Works, reports that consolidated sales of the company and its wholly owned subsidiaries for the 6 months ended June 30, 1947, were \$50,569,333 and that net profit for the period amounted to \$1,536,093. During the 6-months period dividends of \$383,425 were received from The Midvale Company, of whose capital stock Baldwin owns 63.9 pct.

Monarch's Net Sales Rise

Sidney, Ohio

••• Net earnings of the Monarch Machine Tool Co. for the second quarter of 1947, after taxes and other charges and subject to year-end adjustments, totaled \$160,357 or 76¢ per share on the 210,000 shares outstanding. Net earnings for the second quarter of 1946 were \$159,353, equivalent to 76¢ per share.

Net sales for the second quarter of 1947 were \$2,146,247 as compared to \$1,678,902 for the second quarter of last year.

Shows Profit of \$1,088,766

Mount Vernon, Ohio

••• Cooper-Bessemer Corp. has reported net profit of \$1,088,766, equal to \$3.30 per common share on sales of \$13,011,100 for the first half of 1947. During the first half of 1946 earnings were only \$12,021 on net sales of more than \$6,000,000. The excellent showing in first half of 1947 is due largely to a high level of production, according to company officials.

Thompson Profits Up

Cleveland

••• Earnings of Thompson Products Inc. and its subsidiaries in the first half of 1947 rose to \$1,649,763 from an adjusted net profit in the same period of 1946 of only \$156,793.

Net sales for the first six months amounted to \$47,121,093, a new peacetime peak and compared with \$25,383,027 a year ago. Profit was equal to \$3.32 per share on 437,297 shares of common stock outstanding on June 30. Of this amount, \$2.55 a share was earned during the second quarter.

Belgian Wage Demands Worry Steel Leaders As Strike Wave Hits

Paris

•••New cost factors brought about by the continuing inflation in the Western European countries are worrying steel producers who must operate against rigidly controlled price structures. Demands of workers for higher wages in Belgium are causing concern at a time when pessimistic steel producers are beginning to worry about the stability of their high export prices.

At present time there are 32 blast furnaces in operation in Belgium, and the relighting of two others is under consideration. Exports recently have been running at about 50 to 55 pct of total production, roughly the same proportion as was reported for last year.

Official statements are that only 10 pct of the total shipments are being exported to so-called "free markets," where Belgium has no effective trade agreement, and very high prices are being charged. Trade agreements are now in effect between Belgium and France, Holland, Denmark, Norway, Sweden, Finland, Switzerland, and Portugal.

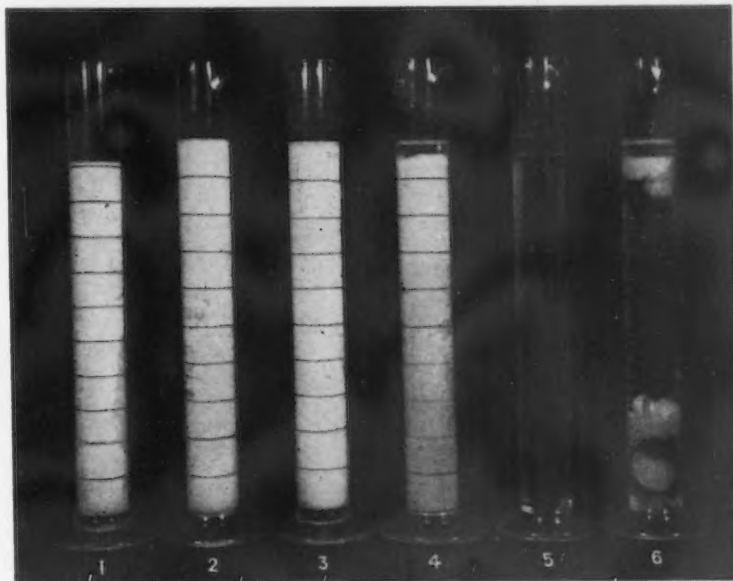
Taking into account the present Belgian domestic price of 3150 B. fr. (about \$71.00) per ton for merchant bars per metric ton, and a weighted export price of about \$105.00, the average return to Belgian mills for merchant bars may be roughly estimated at \$88.00, against an official American export price of about \$78.75 for a 2200 lb ton, and a minimum quotation f.o.b. Great Britain for export of about \$80.00 per metric ton.

The government in Belgium has recognized steel prices as a prime source for controlling inflation, and kept steel price increases since prewar far below the increases which have been made for foundry pig iron, coal, or coke. Strikes in Belgium have been held recently demanding 500 fr. per month bonuses, and the bonuses have been granted in most cases.

Emlon enters the metal-cleaning field!

Wyandotte Chemicals Corporation announces a new detergent of solvent emulsion type — Emlon. This versatile product is especially made

to meet *all* requirements for such a cleaner — as determined by the experience of Wyandotte Service Engineers.



Unretouched photograph showing the comparative stability of Emlon (1, 2 and 3) and a leading competitive product (4, 5 and 6)

Above you see the following 5% emulsions, after standing for 24 hours:

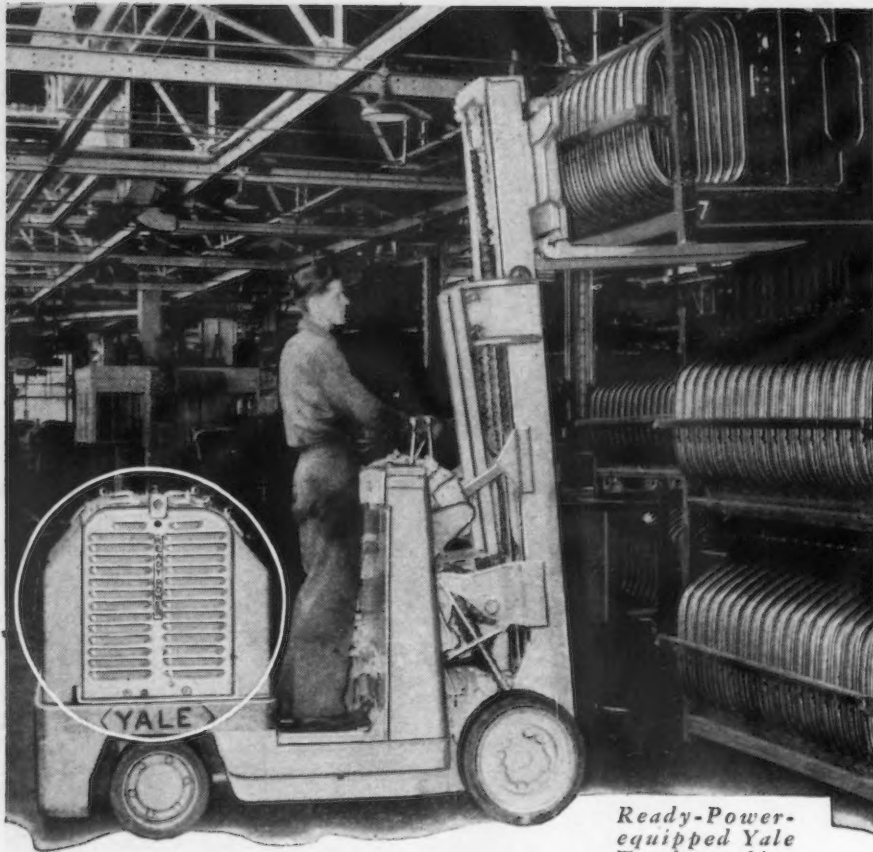
- (1) Emlon in tap water;
- (2) Emlon with 2.5% of sulfuric acid added;
- (3) Emlon with 2.5% of caustic soda added;
- (4) Competitive product in tap water;
- (5) Competitive product with 2.5% of sulfuric acid added;
- (6) Competitive product with 2.5% of caustic soda added. Note separation, or breakdown, of 4, 5 and 6.

This illustrates the unusual *stability* of emulsions formed with Emlon. This stability results in better and faster cleaning action, longer cleaning solution life and low cleaning costs.

Ask your Wyandotte Service Engineer about this new and different product and its many applications in the metal-cleaning field — or write directly to us for descriptive literature.



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3822 Grand River Ave., Detroit 8, Michigan

French Alloy Steel Production at About 40 Pct of Capacity

Paris

••• After the Liberation French alloy steel producers had a serious task to face. During the occupation years production had slowed down and substitute steels were being produced. Maintenance had been inadequate for years, and the labor supply depleted by the depredations of the war.

In addition the alloying elements were scarce. The year 1945 was a period of reconversion when about 100,000 tons of alloy steel was produced. Production during January of that year amounted to about 5000 tons, and increased to 12,000 by December. Production at the beginning of 1946 was considered to be sufficient to permit the relaxation of government controls on most alloy steel products.

Alloy steel production in France continued to improve during 1946, totalling 185,000 metric tons for the year, and exports totalled 5000 tons. Those exports gave the balance of trade a healthy break, and it is hoped that exports this year will be even higher. Estimates of total alloy steel output this year center around 200,000 tons.

Alloy steel capacity in France is stated to be approximately 500,000 tons, so the estimates for 1947 production call for only 40 pct utilization. Consumption in France has increased over prewar, and in some categories production already exceeds prewar.

The best customers at the moment for French alloy steels are Switzerland and Belgium, but a new trade agreement with Holland will provide for substantial shipments to that country in the next 12 months.

Named to USCC Group

Pittsburgh

••• Frederick Baker, treasurer of Blaw-Knox Co. and of Blaw-Knox International Corp., has been appointed a member of the foreign commerce department committee of the United States Chamber of Commerce.

Commerce Dept. Is Now Swamped With German Microfilm Documents

Washington

••• An invitation to technical societies, trade associations and other private industry groups to cooperate with the Department of Commerce, in evaluating an estimated 500,000 technical documents revealing the details of Germany's wartime industrial technology, was issued recently by John C. Green, director of the Office of Technical Services.

The documents, all on microfilm reels and in German, have been collected over the past two years by American technical investigators in Germany. The material was selected from the files of German industrial plants, research laboratories, universities, and government offices because of its potential value to American industry. Included are 5,000,000 pages of technical data reproduced on 5000 microfilm reels.

As rapidly as the microfilm reels are received, OTS catalogues them and publishes the titles in its weekly *Bibliography of Scientific and Industrial Reports*, available from the Superintendent of Documents for \$10 a year.

"Publication of these abstracts, however, is not enough to bring the documents to the attention of American businessmen," Mr. Green said. "If American firms, especially small firms, are to make full use of this technical data, the documents must first be studied, evaluated and in many cases translated by technical experts. They must then be made readily accessible to all business firms. Very few firms have technical experts who can make use of the documents in their present form."

OTS plans to compile and publish a compendium of German wartime technology based on these documents, Mr. Green explained. The material in the compendium will be divided into appropriate sections, each outlining German development in a special field. Each section will refer to the microfilm reels containing the detailed information. With this reference work at hand, any firm can quickly locate the German documents pertinent to its operations.

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Write for Bulletin 306

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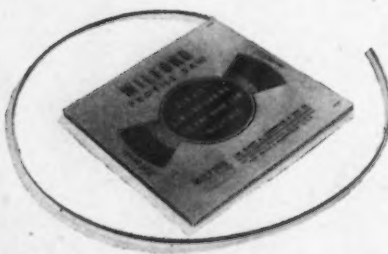
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NEW HAVEN 5, CONNECTICUT, U. S. A.

Announces Program For Machine Tool Show In Chicago, Sept. 17-26

Cleveland

••• Charles F. Kettering, General Motors Corp. research consultant, and James F. Lincoln, industrialist and a leading exponent of the incentive wage plan, are among the 13 widely recognized speakers who will address sessions of the Machine Tool Congress, to be held concurrently with the 1947 Machine Tool Show in Chicago, Sept. 17-26.

Fulton Lewis, Jr., news analyst, will speak at the opening session of the congress Wednesday evening, Sept. 17.

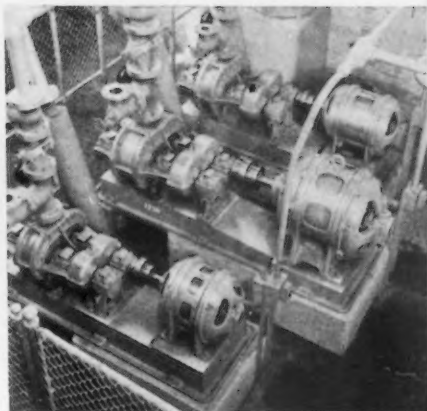
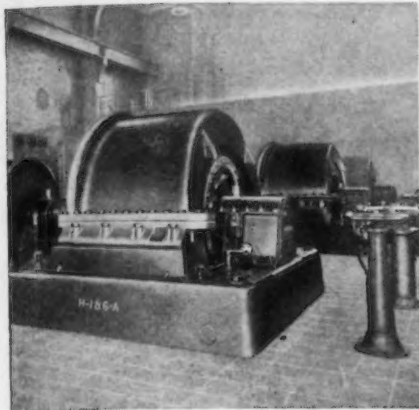
Mr. Lewis' address will be on the subject: "Democracy With a Gun in Her Ribs." George Habicht, Jr., president, American Machine Tool Distributors' Assn. which arranged the program for this session at Hotel LaSalle, will preside.

Remarks of welcome will be made by K. H. Hobbie, president, Machine Tool Congress, and by Herbert H. Pease, president, National Machine Tool Builders' Assn. and president, New Britain Machine Co.

At the meeting Thursday evening, Sept. 18, the Production Engineering & Machine Design Divs., American Society of Mechanical Engineers, have scheduled the presentation of papers on "Form Grinding" by J. I. Wilson, Thompson Grinder Co., and on "Fabricated Construction in Machine Tools" by Mr. Lincoln. W. C. Miller, manager, headquarters manufacturing department, Westinghouse Electric Corp., will preside.

Friday evening, Sept. 19, will be a joint session sponsored by the American Society of Tool Engineers and the American Foundrymen's Assn., with papers on "Turning' Points in the Metal-working Industry" by Myron S. Curtis, assistant director of engineering, Warner & Swasey Co., and on "When and How to Use Cast Iron" by T. E. Eagan, past chairman, Gray Iron Div. of AFA and chief metallurgist, Cooper-Bessemer Corp. The meeting is to be in the Old Town Room of Hotel Sherman, with F. J. Schmitt, di-

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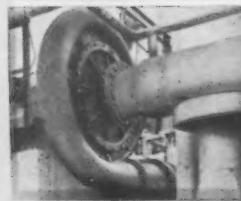
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Used in oil refining, 11,750 CFM capacity. Similar R-C Blowers are widely used in foundries, blast furnaces and other industries requiring high capacity equipment for hoisting or exhausting air or gas.



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Compactness of R-C Blowers suits them to many kinds of built-in applications. This portable aerator, with gas-engine drive, supplies air to fish in hatchery ponds, when the surface is entirely frozen over.



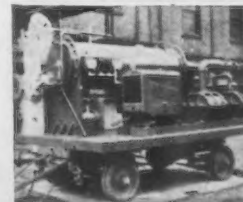
Positive Displacement Meter

Measures and records gas furnished by a public utility to an industrial consumer. R-C Meters with their "cash register" accuracy, measure or proportion any quantity of air or gas up to 1,000,000 CFH.



Inert Gas Generator

Provides protection, economically and efficiently, against fire and explosion hazards, where inflammable gases or liquids are processed or handled. Standard blower and gas pump are incorporated in unit.



R-C *dual-ability* will help you select the right air or gas handling equipment for your specific needs. Consult us without obligation.

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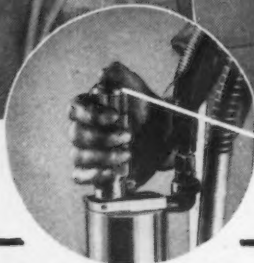
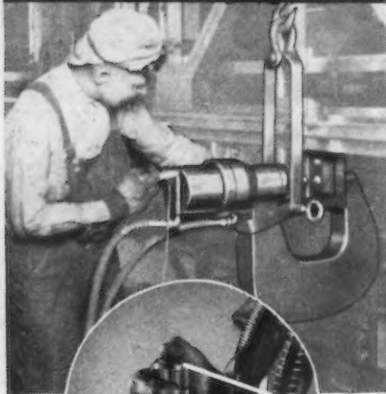
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... designed and built for BETTER, FASTER riveting!

For better riveting, use Hannifin's "hydraulic squeeze" riveting action with either hot or cold rivets... For faster riveting, get it with Hannifin "HY-POWER" units... For prompt, dependable help in getting toolled-up for efficient production, take advantage of Hannifin's vast store of experience in designing and building hydraulic and pneumatic production tool equipment for all branches of Industry. Ask for recommendations—see your local Hannifin representative, or write.

- **FAST.** Time cycle for standard riveters ranges from 1½ seconds to 3 seconds for 3" or 4" stroke units.
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rector of sales, D. A. Stuart Oil Co., Ltd., presiding.

There will be no sessions on Saturday and Sunday evenings. The Machine Tool Show will be closed for the day on Sunday. The Congress will open again on Monday evening, Sept. 22, in the ballroom of the Palmer House, when the address will be made by Mr. Kettering; R. Stafford Edwards, president, National Electrical Manufacturers' Assn., and president, Edwards & Co., will preside.

Tuesday evening, Sept. 23, the Chicago Technical Societies Council, with its representation of some 50 local chapters of technical societies, will sponsor the session at the Civic Opera Bldg. Mr. Hobbie, who is past president of the council and vice-president, Driver-Harris Co., will deliver the message of welcome and Mr. Habicht, president, Marshall & Huschart Machinery Co., will give the address of the evening on "Machine Tools and the Philosophy of Production." Dr. Gustav Egloff, president of the council and director of research, Universal Oil Products Co., will preside.

The Production Engineering Div. and the Research Committee on Metal Cutting Data and Bibliography, American Society of Mechanical Engineers, will direct the program at the Hotel Continental, Wednesday evening, Sept. 24. Two papers, "Practice and Theory in Carbide Milling" by Michael Field, Cincinnati Milling Machine Co., and "Recent Developments in Carbide Application" by J. R. Longwell and Fred W. Lucht, Carboloy Co., will be presented. C. H. Simmons, Yarnell Waring Co., will preside.

The final session will be devoted to an address, "A Trip Through the Machine Tool Show," by Joseph Geschelin, Detroit editor, Automotive Industries. Sponsored by the Society of Automotive Engineers, this concluding session on Thursday evening, Sept. 25, will be in the ballroom of Hotel Knickerbocker, with C. E. Frudden, president, SAE, and consulting engineer, Allis-Chalmers Mfg. Co., as coffee speaker; Stephen Johnson, Jr., vice-president, SAE (Production Activity), and assistant sales manager, Bendix-Westinghouse Automotive Airbrake Co., will be toastmaster.

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coupled with fast
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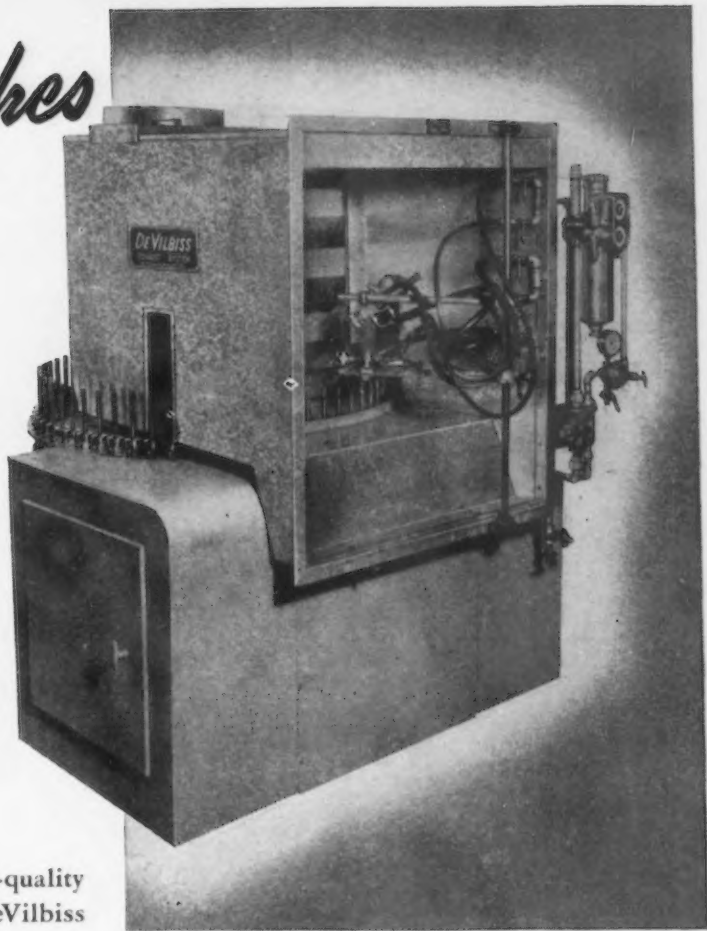
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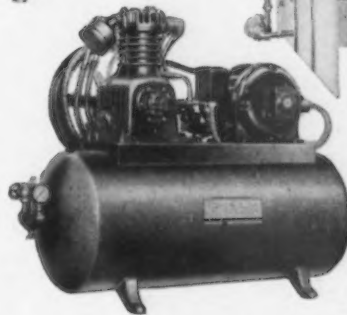
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Equipment for
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Exhaust Systems
of various
types and sizes.



Air-cooled
Compressors and
Tank Mounted
Outfits.



Air Hose, Fluid Hose,
and Connections for
long useful service.

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means Quality in all four . .

**SPRAY EQUIPMENT
EXHAUST SYSTEMS
AIR COMPRESSORS
HOSE & CONNECTIONS**

Plating Waste Disposal

(CONTINUED FROM PAGE 77)

0.00001 in., or about equivalent to a 1 to 2 min plating time in a still tank under bright plating conditions. The maximum plating speed for bright plate in the barrel is about 0.0001 in. per hr or less.

A REPORT on AES Research Project No. 10 on disposal of plating room wastes was presented in a paper by Barnett F. Dodge and Dinwiddie C. Reams, Yale University, New Haven, Conn. This project is still in the stage of surveying the literature on the subject, and it will be some time yet before a specific research problem is chosen. The present paper was confined to a general review of the situation in regard to plating wastes and their disposal. After discussing the origin of the wastes and presenting some data on their volume and composition, the effect of some of the constituents of the commonest wastes on aquatic life and on the operation of sewage disposal systems was very briefly

alluded to. This was followed by a review of various possible methods for treatment of the wastes with particular attention to chemical methods.

In the term "plating room wastes" are included not only the wastes resulting directly from the processes of electroplating but also similar wastes from other metal finishing operations such as the pickling and bright dipping of metals as well as the anodizing of aluminum and the passivating of metals. The wastes produced from the cleaning of metals by means of alkaline solutions to remove oil and grease were not considered in this paper.

The authors described the nature of the wastes, compositions of some plating and related baths from which the wastes were produced, the waste problem in general and methods in solving it. They stated the objectives and requirements of the treatment methods, namely to treat the waste by the simplest and cheapest method which would produce an effluent that would meet the requirements of the local or

state authorities for discharge into a stream or a sanitary sewer. Another object of the research (although secondary) will be the development of methods for turning the impurities into some products that can be disposed of by sale or re-used by the mill itself.

The authors discussed various chemical treatments, such as the addition of an alkali to neutralize the acid and precipitate all the heavy metals. Among these alkalies might be caustic soda, soda ash, quicklime, hydrated lime or limestone.

The authors discussed the treatment of chromate wastes and cyanide wastes. They also dwelt for some time on the ion exchange method of purifying waste solutions and extracting the metals therefrom.

The paper closed with a description of a number of tested methods for treatment of plating and related wastes.

Army and Navy Offers Out Soon for Jobs In High Salary Research

Washington

••• The Army and Navy soon will begin to put out feelers to research experts in industry and in universities in the hope of luring them to newly-created \$10,000 to \$15,000 civilian research jobs.

Congressional approval to the hiring by the armed services of higher salary bracket scientists was given in the closing days of the recently-adjourned Congress and was endorsed by President Truman.

Competition of high salaries offered by industry brought the Army and Navy to bring pressure upon Congress for passage of the bill (HR 4084), authorizing appointment of 45 professional and scientific positions with the armed forces. The new law authorizes 30 such appointment for the Army and 15 for the Navy.

Both services are now putting out feelers to research experts in private business in the hope of recruiting the most highly qualified men available to advise the Air Force, Signal Corps, Ordnance Dept., and other branches of the services on new developments.

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**MAKE MORE PROFIT
ON EVERY OPERATION**

With ARMSTRONG TOOL HOLDERS you can take advantage of the new high speeds and heavier feeds of the newer cutting materials, without revolutionary changes or costly experimentation. They are the most profitable tools obtainable; the lowest in initial cost, the longest in service and most economical in use, for all incorporate the basic Armstrong Principle of small interchangeable cutter-bits in permanent drop forged shanks. They are the most readily obtainable tools too, for they are stocked by all leading distributors.

Write for circulars describing:

- (1) ARMSTRONG Carbide TOOL HOLDERS and ARMIDE (Carbide Tipped) Cutters
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309 No. Francisco Ave.
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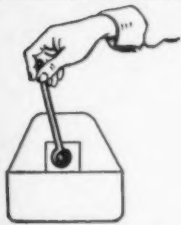
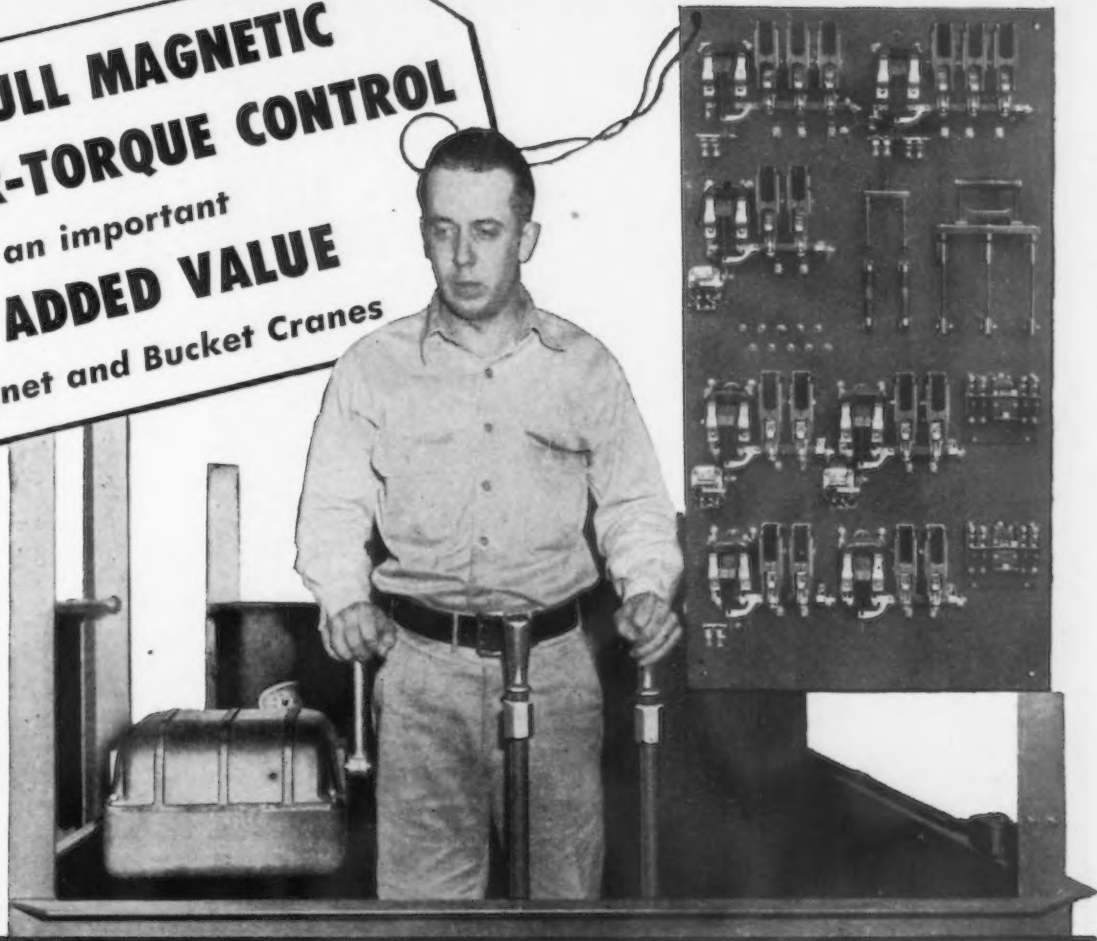
P&H ELECTRICAL EQUIPMENT . . . HEART OF CRANE DEPENDABILITY

**AC FULL MAGNETIC
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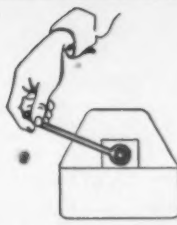
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3rd LOWERING STEP —
maximum speed,
minimum counter-torque



4th LOWERING STEP —
automatic acceleration
as motor drives with load



5th LOWERING STEP —
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motor driving with load

Smooth Acceleration as well as Smooth Deceleration . . . Reduces Maintenance

- Counter-torque control eliminates mechanical load brake and its maintenance.
- With full magnetic counter-torque control, the operator lowers loads steadily and smoothly — without abrupt changes in speed.
- Counter-torque lowering provides electrical braking which retards the load. Magnetic motor brake merely brings load to rest and holds it there. Result: magnetic brake maintenance is greatly reduced.
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The cost of production is determined by the rate of production . . . and the rate of production is governed by handling. You'll find that handling, involved in every phase of your operation, offers the most opportunities to cut production costs. Send for a Pocket Catalog, and you will find a Towmotor Fork Lift Truck or Accessory that will help complete every handling job on schedule, with far less cost and effort. Towmotor Corporation, Division 15, 1226 East 152nd Street, Cleveland 10, Ohio.

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TOWMOTOR
THE ONE-MAN-GANG

**FORK LIFT TRUCKS
and TRACTORS**

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

Weekly Gallup Polls

(CONTINUED FROM PAGE 119)

In fact, the weight of sentiment among those who have heard or read about the act is that it will either have no effect on the number of strikes or will actually lead to more.

The public's views on whether the act will effectively reduce strikes were sounded as follows by the institute:

"As a result of this law, do you think there will be more strikes during the next 3 years, or fewer?"

The vote of all who have heard or read about the act (six out of ten persons polled) is:

	Pct
More strikes	24
Same number	8
Fewer strikes	26
No opinion	42

} 32

Unions in several parts of the country have adopted the strategy of starting strikes and taking other steps to test the legality of the new measure.

The main criticism of the act among voters with opinions is that it is "too harsh on the unions." However, if time shows that union practices against which the public has long complained are not effectively curbed by the new law, sentiment could possibly veer around to the position that the act is not harsh enough on unions.

Borg-Warner Sales

Up 337 Pct Over 1940

Chicago

••• A sales increase of 337 pct for the first 6 months of this year over a similar period in 1940 was revealed on Aug. 1 by the Borg-Warner Corp. Net profits of \$9,999,605 were reported for the half year period.

C. S. Davis, president of the corporation, commenting on the report, said, "Operations for the first 6 months of 1947 reflect the great increase in our productive capacity since the prewar period and is the direct result of our expenditure of approximately \$35 million since January 1940 for improved and increased manufacturing facilities." Mr. Davis continued, "A carefully planned program of diversification is largely responsible for our growth." During the time of this expansion employment rose from 9697 in July 1940 to 22,734 on July 1, 1947.

FTC Sues American Iron & Steel Institute

(CONTINUED FROM PAGE 114)

nation against portions of the purchasing public in large areas."

This discrimination in price is effected, the complaint states, by depriving purchasers of the advantage which except for the conspiracy and practices of the respondents would accrue to them as a result of their proximity to the plants of the respondent producers, and by requiring purchasers to pay increases over what the net prices would have been had they been fixed by competition.

For the purpose of frustrating price competition, the complaint alleges, the respondents "by concerted action and agreement" have "adopted and systematically put into effect a common method and policy with regard to competition in price and other kinds of competition directly and substantially affecting prices."

Specifically, the complaint continues, the respondent producers entered into agreements and understandings that they would offer their respective products for sale on a basis of price quotations cooperatively and collectively provided for under a system of common basing points, common terms, and sales conditions determined by joint action. All these practices were designed to result in "identical delivered price quotations," the complaint states.

The common basing point system used by the respondent producers involves employment of a formula through which identical price quotations at any given destination "may be automatically arrived at with mathematical precision," according to the complaint.

The respondents have agreed upon a common list of charges to be added to base prices in lieu of switching, shipping and freight charges, the complaint states. These are stated to have been compiled and published by the Institute and to be employed by the producing respondents in the calculation of delivered price quotations.

In using this system, the respondents "have refused to assess their charges for delivery according to the actual cost," the complaint states, but "have calculated

their delivery charges on the fiction that each shipment is made from one of a limited number of common basing points cooperatively used and recognized among producer-respondents."

Another "fiction" described by the complaint is the assessment of delivery charges on the basis of shipment by all-rail freight when the method of delivery actually employed was "frequently" by truck or water carrier at lower rates. "Arbitrary amounts" have also been added to delivered prices as "switching charges," rather than the actual charges imposed by railroads for switching, the complaint alleges.

Among other steps taken to avoid price variations, the complaint alleges an agreement among the respondents as to "standards and specifications covering every possible variation and classification of product." They have reached a "common understanding and agreement as to basic products upon which base prices are quoted, and have agreed

upon 'extra' charges, or additions to the base prices to cover every characteristic of an iron or steel product differing from those specified in the basic product classification," the complaint states. It adds:

"From time to time, through agreement among themselves, respondents have increased the price of 'extras' by substantial amounts aggregating a high percentage of the base price factor and without relation to the extra cost involved.

"The 'extras' on a multitude of alloy steel products have been increased to a point where they are several hundred pct of the base price."

Price cutting was also precluded, the complaint alleges, through rules for preventing any of the respondent producers from "evading or deviating from the program and policy of having delivery charges made identical for all. . . ." Geographical advantages and disadvantages among sellers and buyers were thus removed as a factor in price competition, it states.

Republic to Build Large Pipe Mill At Present Plate Mill

Cleveland

••• Plans for construction of a mill to produce large diameter pipe at Gadsden, Alabama, have been announced by Republic Steel Corp.

Construction of the new mill, next to the plate mill at Republic's steel plant in Gadsden, will be completed as soon as possible, the announcement stated.

When completed the new mill will produce electric welded steel pipe in diameters from 20 in. to 30 in. and in lengths of 30 ft. The pipe will be made from flat steel plates rolled on Republic's Gadsden plate mill. This plate will be cold formed into tubular shapes and electrically welded.

The mill will be housed in two buildings to be built adjacent to the plate mill. The first of these will be 360 ft long and will extend from the end of the present plate mill shipping building. The second will run parallel to the first and will be

648 ft long. Each will be 113 ft wide and will be of the heavy duty factory type. Open air inspection and storage areas will also be added.

Engineering of the entire project is now well under way and every hope is held that the mill may be in operation by June, 1948. It is likely that employment of 300 additional persons will result from putting the mill into operation.

Electro Firm Organized

Washington

••• Plans for the organization of a California corporation under the name of Electrolitic, Inc., with a capitalization of a million dollars, were announced here with the purchase from WAA of the former government-owned Western Electrochemical Co.'s perchlorate plant in Los Angeles. The buyer was W. W. Courtney & Associates, of Los Angeles, who paid \$350,000 for the \$1.6-million factory. The new firm will manufacture industrial chemicals and electrolytic metals, the buyer said.

Industrial Briefs . . .

• **OPENS OFFICE** — Frank A. Burns is opening a public relations office at 1122 Pacific Mutual Bldg., Los Angeles, for Columbia Steel Co. For the past 5 years Mr. Burns has been assistant to Charles Huse, director of Columbia's San Francisco public relations office and during the war while Mr. Huse was on military leave, Mr. Burns was acting director.

• **NEW COMPANY** — Charles V. Schuyler, president, and Henry B. Rebmann, secretary and treasurer, have formed Redhard Metals Inc. at Hatboro, Pa. They will supply cutting tools, precision castings, and high temperature alloys and do metal forming and finishing.

• **NEW WELDING ROD PLANT**—Peacetime centralization of output and research in a Manhattan plant capable of turning out 90 special types of welding rods valued at \$10 million annually has been accomplished by Eutectic Welding Alloys Corp., according to an announcement by R. D. Wasserman, president, during inauguration of the new facility at 110 Duane St.

• **WESTERN REPRESENTATIVE**—Desmond Gamble has been appointed sales representative of McNally Pittsburg Foundries, Inc., Pittsburgh, Kansas, founders of process and alloy iron. He takes charge of all territory in the western half of the country.

• **EXPANDS PLANT**—U. S. Steel Products Co. has completed plans for more than 32,000 sq ft enlargement to its plant located near Dolton, Ill. Four new buildings are to be added to the existing plant.

• **ELECTED CHAIRMAN** — E. A. Buxton has been elected chairman of the Committee on Steel Pipe Research of the American Iron & Steel Institute, New York. He succeeds E. P. Corey who has retired after 52 years in the steel pipe industry. Mr.

Corey served as chairman of the committee from its inception in 1942. He has been general manager of tubular sales for the Youngstown Sheet & Tube Co. Mr. Buxton is sales manager, pipe and tubes, for the Bethlehem Steel Co. Oscar I. Strickland, manager of tubular sales for the Wheeling Steel Corp., has been elected vice-chairman of the committee.

• **EXPANSION PROGRAM** — The Edison Storage Battery Div. of Thomas A. Edison, Inc., West Orange, N. J., has inaugurated a plant-expansion program, involving an expenditure of \$2 million. The present program will embrace new equipment to be installed in plant buildings previously employed by wartime activities of other divisions of the Edison Industries. In addition to the current expansion program, the establishment of a plant in Great Britain for manufacture of the Edison Miners Safety Electric Cap Lamp was initiated earlier this year.

• **ORDERS U. S. MACHINES** — Arthur Lee & Sons, Ltd., Sheffield, England, has placed a contract with Hamilton Pump Co., Pittsburgh, for three new high-speed grinding and finishing machines. An import license was granted by the British government for purchase of the equipment which will be chiefly used for grinding and finishing stainless strip.

• **BAKER INCREASES CAPACITY**—The Baker-Raulang Co. of Cleveland, one of the country's largest manufacturers of power industrial trucks, tractors and cranes, is increasing its productive capacity by 50 pct. An addition to the company's No. 2 factory at 8200 Baker Ave. Cleveland, is already under construction.

• **EXPANDS GEAR PRODUCTION**—W. A. Jones Foundry & Machine Co., 4401 W. Roosevelt Road, Chicago, will soon start construction of a two-story building. The structure will contain about 20,000 sq ft of floor space.

WAA Stakes Out Pipe For Farms and Wells

Washington

• • • **War Assets Administration** this week set aside its entire stock of black or galvanized butt, lap-weld, or seamless pipe, ranging from 2 to 6" standard mill lengths for exclusive sale to agricultural buyers.

WAA admits it doesn't know how much pipe is involved, but Senator Martin, R., Pa., chairman of the steel subcommittee of the Senate Small Business Committee, hopes that at least 250,000 ft will be made available. Sen. Martin has been endeavoring for some time to ease this situation.

Orders to WAA regional offices direct the set-aside of present and future inventories of surplus steel pipe until Oct. 31. Efforts to secure channeling of pipe for replacement and repair of water wells and watering systems in midwest farm and grazing areas have been under way for some time.

Following recommendations of the Agriculture Dept., WAA is offering the pipe to persons who will certify that the ultimate consumer will be farmers or individuals who will use the pipe only for repair or development of water wells or water systems on farms in Montana, Wyoming, North Dakota, South Dakota, Nebraska, Minnesota and Wisconsin.

Pipe suppliers told Sen. Martin that distribution of steel pipe to the midwest had been seriously affected by the withdrawal from distribution by one larger steel pipe producing company.

Billet Furnaces Rebuilding

Pittsburgh

• • • **Two billet heating furnaces** at Joliet, Ill., works of American Steel and Wire Co., will be reconstructed by Rust Furnace Co., Pittsburgh.

The furnaces at this U. S. Steel subsidiary plant will be extended to accommodate an increased number of billets, necessary to compensate for the proposed increase in speed of two of the plant's continuous rod mills.

Construction Steel . . .

••• Fabricated steel awards this week included the following:

- 1800 Tons, Camden, N. J., hospital building to George A. Fuller, New York.
- 800 Tons, Wilkes-Barre, Pa., bridge, Pennsylvania Dept. of Highways, to American Bridge Co., Pittsburgh.
- 500 Tons, Niches, Tex., power plant to Mosher Steel Co., Houston, through Stone & Webster Engineering Corp., Boston, engineers.
- 435 Tons, Plymouth Meeting, Pa., E. J. Lavino Co., addition to warehouse, to Bethlehem Fabricators Inc., Bethlehem.
- 350 Tons, Homestown, Pa., Bundy Tubing Co., building, to Lehigh Structural Steel Co., Allentown, Pa.
- 350 Tons, Baltimore, plant for Lever Bros. Co., Cambridge, Mass. to Bethlehem Steel Co. through Stone & Webster Engineering Corp., Boston, engineers.
- 280 Tons, Kankakee, Ill., building for General Mills, J. L. Simmons & Co., low bidder.
- 225 Tons, Whiteside County, Ill., bridge section 17R-IVF to American Bridge Co., Pittsburgh.
- 190 Tons, Morgan County, Ill., bridge section 25S-F.

175 Tons, Auburn, Mass., plant for Baldwin-Duckworth division of Chain Belt Co. to Groisser & Shiager Iron Works, Somerville, Mass.

••• Fabricated steel inquiries this week included the following:

- 1265 Tons, Thermopolis, Wyo., superstructures for bridges, relocation of C. B. & Q. R.R., Bureau of Reclamation, Thermopolis, Wyo., Spec. 1901, bids to Sept. 3.
- 1200 Tons, Bonville, Wyo., bridge No. 1901.
- 1000 Tons, Lancaster, Pa., Armstrong Corp. Co., laboratory building, bids in.
- 540 Tons, Glenn County, Calif., superstructures, two bridges across Sacramento River and Rasor Slough near Butte City, California Div. of Highways, Sacramento, bids to Sept. 10.
- 265 Tons, Monterey County Calif., overhead crossing over S.P. R.R. tracks on Sanborn Road, near Salinas, California Div. of Highways, Sacramento, bids to Sept. 10.
- 200 Tons, State of Oregon, bridge for Union Pacific R.R.
- 200 Tons, Cambria County, Pa., Pennsylvania Dept. of Highways, bridge, to be rebid Aug. 22.

125 Tons, Philadelphia, alterations to Pratt St. elevated station, City of Philadelphia, Aug. 28.

••• Reinforcing bar awards this week included the following:

- 275 Tons, Urbana, Ill., chemistry and chemical building, University of Illinois, through John Felney Co., to Bethlehem Steel Co., Bethlehem.
- 145 Tons, Tomah, Wis., sewage treatment plant, Central Engineering Co. Oshkosh, Wis., low bidder.
- 130 Tons, Port Washington, Wis., filtration plant, J. J. Duffy Co., low bidder.

••• Reinforcing bar inquiries this week included the following:

- 110 Tons, Monterey County, Calif., overhead crossing over S.P. R.R. tracks on Sanborn Road, near Salinas, California Div. of Highways, Sacramento, bids to Sept. 10.

••• Railroad awards this week included the following:

- Chesapeake & Ohio Ry. Co. has ordered 1000 70-ton all-steel hopper coal cars from the American Car & Foundry Co. The cars will be built in Huntington, W. Va. Union Pacific R.R. has purchased ten diesel engines from Fairbanks-Morse & Co., Chicago.

RFC Sends Kaiser To Congress for a Debt Reduction at Fontana

Washington

••• Any debt cancellation afforded Henry J. Kaiser on his Fontana (Calif.) steel plant loans will have to be directed by Congress, the Reconstruction Finance Corp. said last week.

RFC, replying to Mr. Kaiser's request for cancellation of \$85,329,544 of the \$105,452,160 made available to Fontana by the Federal Government, told the West Coast industrialist it could find no basis for the requested debt forgiveness.

Furthermore, RFC said, there is no basis for Mr. Kaiser's presumption that financial aspects of the Fontana and Geneva (Utah) plants are similar. U. S. Steel Corp. bought the Geneva plant as surplus property for \$47.5 million.

"Substantial reduction of the debt of the Kaiser Co., Inc., is asked at a time when Fontana's peacetime earning capacity has been only partially developed and despite the fact that current earnings do not reflect the substantial benefits expected from plant improvements now being made with the proceeds of an additional RFC loan of \$11,500,000 made in 1945," RFC wrote Mr. Kaiser.

On the West Coast, meanwhile, Mr. Kaiser told THE IRON AGE he had "just begun to fight" in the

Fontana controversy. "I am going to get in touch with the Western States Council, which has done a remarkable job in helping me," he said. Mr. Kaiser also accused RFC of "subsidizing" U. S. Steel Corp., which he inferred is holding down steel production to maintain high prices.

RFC said in its letter to Mr.

Kaiser that "the real answer" to the Council's problem "appears to be in the marshalling of private capital behind Western steel plants. What is needed is sufficient private capital to liquidate the Government investment on the basis of the sound value of the Fontana assets," RFC said bluntly.

H. K. Hottenstein Dies

Chicago

••• Henry K. Hottenstein, Chicago regional business manager of THE IRON AGE from 1931 until recently, died Aug. 18 in Evanston, Ill., of a heart ailment complicated by pneumonia. He was 70 years old. A native Pennsylvanian, Mr. Hottenstein spent most of his business career in the business paper publishing field. Following a period as an advertising representative with the Philadelphia Press and Philadelphia Ledger, he joined the advertising staff of Engineering & Mining Journal in 1909. He was business manager of Mining & Metallurgy from 1922 to 1926 and was co-publisher of Sanitary & Heating Age from the latter year until 1931. He had been active in the Chicago Executives' Club, the Milwaukee Athletic Club, and the Na-



tional Industrial Advertisers' Assn.

"Approved Dealer" Agreements with WAA Cancelled Aug. 31

Cleveland

••• Bad news for some 1,400 machine tool dealers who have been working with War Assets Administration under "approved dealer" agreements came this week in the form of cancellation notices on "approved dealer" agreements effective Aug. 31, 1947.

According to WAA's official announcement, commissions which are paid out of WAA's budgeted funds must be discontinued because of sharply decreased appropriations.

At the same time, WAA announced that a recently announced 17½ pct discount on certain types of surplus machine tools purchased for resale will be extended to all standard general purpose machine tools except those in critically short supply.

Eligible purchasers at the discount are machine tool dealers, rebuilders, manufacturers, exporters and other distributors who buy for resale.

It was emphasized that former "approved dealers" will become eligible for the discount by simply certifying that they have been actively engaged in selling production equipment and that purchases are made for resale and not for personal use.

Special credit arrangements to enable more dealers to participate in the discount plan are also under consideration by WAA officials. WAA regional offices will honor shipping instructions of all eligible dealers, regardless of consignee.

Reliable sources in the trade were willing to hazard the guess that some dealers and possibly numerous machine tool builders might now be tempted to buy for stock at 17½ pct discount. Major objection on the part of producers in the past has been that "it was too tough to make out." Present prices plus the new discount have changed this situation materially.

Machinery Dealers National Association is working toward the establishment of a permanent ethics committee on a national and local basis. The subject will be studied

Plan to Bring More Dealers In with Special Credit Facilities Weighed

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by local chapters and their reports will be passed on to the national committee for further study and action. Results of the national committee will be submitted to the board of directors of MDNA for approval before it is brought to the membership to be considered for adoption at the next annual meeting.

Elsewhere, preparations for the 1947 Machine Tool Show are going ahead at a furious clip at National Machine Tool Builders' Association headquarters, Cleveland. Among other things, NMTBA is trying to make arrangements for a passenger steamer or two to be anchored in the river, thus providing additional visitor accommodations.

Confronted as they have been with an avalanche of surplus government equipment offered at cut-throat prices, some machine tool builders who diversified their products have less of a business problem than some of the straight line companies.

A prospectus recently issued by a Massachusetts company and its subsidiary shows its business this year has consisted of 46 pct automotive repair and service machinery, 38 pct cutting tools and 16 pct machine tools. Another Massachusetts tool builder's business has been about 25 pct tools and 75 pct other products. Biggest percentage of sales of a Rhode Island firm is in cutting tools. That, it is understood, is how machine tools have fared with other builders with diversified lines. While net profits from diversified lines are not perhaps in proportion to those from machine tools, they are satisfactory and plant production and payrolls are more stable.

In Detroit, sources in the trade report volume has fallen off considerably for the month of August. Now orders are at a standstill on new equipment, as everyone is awaiting the unveiling of the latest super equipment at Chicago in September. The small number of inquiries now being received usually ask "if an order is placed immediately, will the equipment include all the recent improvements the trade has heard so much about?"

More price increases are on the way. This is particularly true in small machines and portable tools. Builders point out that the cost of electrical equipment has jumped three times in the last six months and at present these prices are about 30 pct over what they were at the first of the year. Machine tool makers would prefer a position which would permit firm price quotations. Authorities here believe that by December they may be able to discontinue escalator clauses or price at time of shipment qualifications. These companies point out that at the moment even castings needed for machinery are not quoted on firm prices except where available out of inventories, or at the most shipment within 90 days.

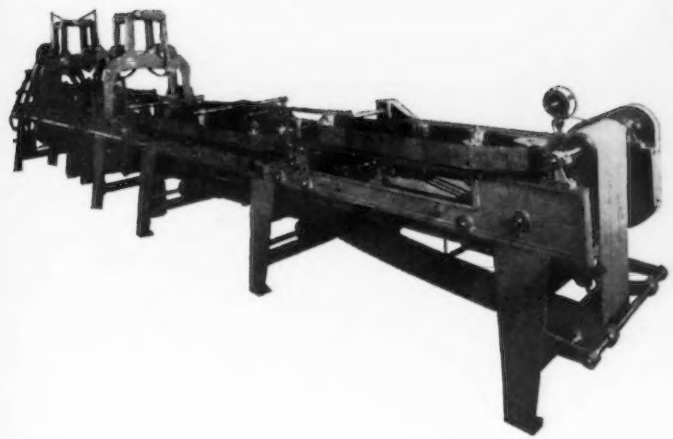
In the East, it is reported that builders are continuing to suffer from the low rate of labor productivity. Symptomatic of these conditions is the case of one builder who is producing the same tool as before the war when it required 14 hrs for assembly. Now the same number of men take 24 to 25 hrs for assembling. Prewar monthly production rate on this tool was 14 a month; now only seven are produced a month with the same number of men, and of the seven perhaps one will be defective. Dealers report that they have been deluged with requests for service calls on new tools after delivery when it has become apparent that minor parts have been omitted or the tool has been improperly adjusted by the assembly crew. Dealers in the East report that inquiries continue at a fairly high level but that orders materializing from them are few.

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NONFERROUS METALS

... News and Market Activities

Zinc

••• Demand for zinc is quiet, confounding some members of the industry who had anticipated a rush of orders when the veto of the Premium Price Plan extension act made it apparent that some zinc properties would have to close down. Consumers, however, are conscious of the fact that zinc stocks went up by some 7000 tons in July, due largely to the vacation periods among consuming plants. Already there are reports of large-scale mine shutdowns in the Joplin District and some in the trade are of the opinion that some Far West producers may also be required to close. In most of these properties, zinc ores also contain gold, silver or lead and it is expected that these profitable byproducts may serve to carry the less profitable zinc production. Galvanizers demand for zinc is not active and producers attribute this situation to the steel shortage. There are no large requirements for export tonnage of zinc which producers see as the result of the worldwide dollar shortage. The market continues at previous price levels.

Copper

••• Domestic demand for nearby copper continues strong but some producers report that requirements for copper deliveries after the end of September are absent. Export demand is said to be very quiet but an export copper price of 21.50¢ f.a.s. New York is reported which might serve to indicate that producers are hesitant about selling for export when the domestic market continues strong. Wire mills continue willing to take all the copper they can obtain. Brass mill operations have been reduced

to a 4 or 5 day week and their copper requirements are somewhat lower than in the spring. There was a one-day strike at the Phelps Dodge Copper Products Corp. plant at Elizabeth, N. J., but negotiations with the union are all but concluded at all this company's and American Smelting and Refining Co.'s plants. It is significant that there will be no costly strikes in the domestic copper industry at this time. The only loss of production was caused by the shutting down of casting furnaces for several weeks so as to prevent solidification of the molten metal in the furnaces in the event of a strike. Observers see no price movement in copper during the next few months. After that time, assuming that the domestic market may not be able to absorb all domestic and a large part of the foreign production, fluctuation in the price of copper depends largely on what happens to the Marshall Plan and the availability of dollars abroad. It is the opinion of market observers that it would require a decline in price of more than several cents a pound to stop off copper production by some producers and so stabilize supply and demand.

Lead

••• Supply and demand for lead continue in balance and producers are optimistic over the market outlook provided there is no labor trouble in the automobile industry which would close down battery requirements. Future demands of the paint manufacturers, the cable producers and the tetraethyl lead manufacturers are foreseen to continue at a high rate, barring a major slump in business. Producers do not expect any

early change in the price of lead and point out that stocks are not being built up but that all consumers are able to obtain their full requirements.

Tighten Tin Controls

Ottawa

••• Canadian Wartime Prices and Trade Board has issued a new order, A-2417, effective Aug. 5, dealing with control over tin metal, tin alloys, ingot and scrap. All imports of these metals now must be reported within 10 days to the administrator of nonferrous metals. Importations of tin in blocks, pigs or bars has been and is still subject to permit control under the Import and Export Permits Act.

All tin scrap both domestic and imported, in the possession of scrap dealers, may be sold only to other scrap dealers or to licensed smelters, according to the new order. The pricing of tin continues as in the previous order A-1780.

German Brass Mills Open

Washington

••• The electric cable plant, Kabelwerke Neumayer at Nuremberg, has begun melting brass for rolling into rods, strips and sheets, according to a report by the American Military Government in Germany, for the last half of July.

Also, the Vereinigte Deutsche Metallwerke at Hedderheim (Hesse) has reactivated some equipment for fabrication of brass products although curtailed supplies have restricted operations at both plants.

Scrap Market Inactive

••• Dealers report that there is no price movement in metals scrap since the rise in heavy copper items two weeks ago. Most refiners are out of the market and reenter it only one or two at a time for limited quantities. The smelters are not buying at this time.

Nonferrous Metals Prices

Cents per pound

	Aug. 13	Aug. 14	Aug. 15	Aug. 16	Aug. 18	Aug. 19
Copper, electro, Conn.	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn.	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York	80.00	80.00	80.00	80.00	80.00	80.00
Zinc, East St. Louis	10.50	10.50	10.50	10.50	10.50	10.50
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80	14.80

NONFERROUS METALS PRICES

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point (min. 10,000 lb)	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American Laredo Tex.	\$2.00
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be.....	\$17.00
Beryllium aluminum, 5% Be; dollars per lb contained Be	\$35.50
Cadmium, del'd	\$1.75
Cobalt, 97-99% (per lb)	\$1.65 to \$1.72
Copper, electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	21.625
Gold, U. S. Treas., dollars per oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$80 to \$90
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%,	20.50
Magnesium, sticks, carlots	36.00
Mercury, dollars per 76-lb flask, f.o.b. New York	\$85.00 to \$87.00
Nickel, electro, f.o.b. New York ..	37.67
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$53 to \$56
Silver, New York, cents per oz.	65.25
Tin, Straits, New York	30.00
Zinc, East St. Louis	10.50
Zinc, New York	11.005
Zirconium copper, 6 pct Zr, per lb contained Zr	\$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

35-5-5 ingot	
No. 115	19.00
No. 120	18.50
No. 123	18.00
80-10-10 ingot	
No. 305	23.00
No. 315	21.00
88-10-2 ingot	
No. 210	28.75
No. 215	27.25
No. 245	21.25
Yellow ingot	
No. 405	15.25
Manganese Bronze	
No. 421	17.25

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys:	
0.30 copper, max.	15.75
0.60 copper, max.	15.50
Piston alloys (No. 122 type)	14.25
No. 12 alum. (No. 2 grade)	13.75
108 alloy	14.00
195 alloy	14.75
AXS-679	14.00
Steel deoxidizing aluminum, notch-bar, granulated or shot	
Grade 1—95 pct-97½ pct	14.50
Grade 2—92 pct-95 pct	13.00
Grade 3—90 pct-92 pct	12.50
Grade 4—85 pct-90 pct	11.75

Electroplating Supplies

Anodes	
(Cents per lb, f.o.b. shipping point in 500 lb lots)	
Copper, frt. allowed	
Cast, oval, 15 in. or longer	37%
Electrodeposited	32.34
Rolled, oval, straight, delivered ..	32.59
Brass, 80-20, frt allowed	
Cast, oval, 15 in. or longer	33%
Zinc, Cast, 99.99	18%
Nickel, 99 pct plus, frt allowed	
Cast	51
Rolled, depolarized	52
Silver, 999 fine	
Rolled, 1000 oz. lots, per troy oz.	67½

Chemicals

(Cents per lb, f.o.b. shipping point)	
Copper cyanide, 100 lb drum	43.00
Copper sulphate, 99.5, crystals, bbis	11.50
Nickel salts, single, 425 lb bbis, frt allowed	14.50
Silver cyanide, 100 oz. lots, per oz.	54.00
Sodium cyanide, 96 pct, domestic, 200 lb drums	15.00
Zinc cyanide, 100 lb drums	34.00
Zinc sulphate, 89 pct, crystals, bbis, frt allowed	7.75

Mill Products

Aluminum

(Cents per lb, base, f.o.b. shipping point, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall: 3S, 43.5¢; 52S-O, 67¢; 24S-T, 71¢; base, 30,000 lb.	
Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢ 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75S-AL, 30.5¢; base, 30,000 lb.	
Flat Sheet: 0.136-in. thickness: 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb.	
Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S, 45.5¢; base, 30,000 lb.	
Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 37.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢; 1 in., 2 in., 27¢; base, 5000 lb. Rod: 2S, 3S, 1¼ to 2¼ in. diam, rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. Round Wire: drawn, coiled, B & S gage 17-18; 2S, 3S, 33.5¢; 56S, 39.5¢; 10,000 lb base. B & S gage 00-1: 2S, 3S, 21¢; 56S, 30.5¢. B & S 15-16: 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.	

Magnesium

(Cents per lb, f.o.b. mill. Base quantity 30,000 lb.)

Sheet and Plate: Ma. F.Sa. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 14, 69¢-74¢; 16, 79¢-81¢; 18, 87¢-89¢; 22, \$1.25-\$1.31; 24, \$1.71-\$1.75.	
Round Rod: M, diam, in., ¼ to ¾, 47¢; ½ to ¾, 45¢; 1¼ to 2¼, 43.5¢; 3¼ to 5, 42.5¢. Other alloys higher.	
Square, Hexagonal Bar: M, size across flats, in., ¼ to ¾, 52.5¢; ½ to ¾, 47.5¢; 1¼ to 2¼, 45¢; 3¼ to 5, 44¢. Other alloys higher.	
Solid Shapes, Rectangles: M, form factors, 1 to 4, 46¢; 11 to 13, 49¢; 20 to 22, 51.5¢; 29 to 31, 59.5¢ 38 to 40, 75.5¢ 47 to 49, 98¢. Other alloys higher.	
Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, \$1.21; 5/16 to ¾, \$1.12; ¾ to 7/16, 97¢; 0.058 to 0.064, 7/16 to ½, 89¢; ½ to ¾, 81¢; 0.065 to 0.082, ¾ to 1, 76¢; ¾ to 1, 72¢ 0.083 to 0.108, 1 to 2, 68¢; 0.165 to 0.219, 2 to 3, 59¢; 3 to 4, 57¢. Other alloys higher.	

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets	41	41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks .....	..	31

Zinc

(Cents per lb, f.o.b. mill)

Sheet, l.c.l.	15.50
Ribbon, ton lots	14.50
Plates	
Small	13.50
Large, over 12 in.	14.50

Copper, Brass, Bronze

(Cents per pound, f.o.b. mill)

	Extruded Shapes	Rods	Sheets
Copper	33.53	..	33.68
Copper, hot-rolled	30.03	..	..
Copper, drawn	31.03	..	..
Low brass	34.04*	31.07	31.38
Yellow brass	32.39*	29.32	29.63
Red brass	34.65*	31.68	31.99
Naval brass	29.56	28.31	34.25
Leaded brass ..	27.98	24.39	29.63
Commercial			
bronze	35.52*	32.80	33.11
Manganese bronze ..	33.14	31.64	37.75
Phosphor bronze, 5 pct.	53.25*	52.25	52.00
Muntz metal ..	29.17	27.92	32.36
Everdur, Herculeoy, Olympic, etc.	37.07	35.57	38.44
Nickel silver, 5 pct.	41.20	40.28	38.67
Architectural			
bronze	27.94	..	..
*Seamless tubing.			

Scrap Metals

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Brass Mill Scrap

(Lots of less than 15,000 lb.)

Cartridge brass turnings	14½
Loose yellow brass trimmings	15½

Copper and Brass

No. 1 heavy copper and wire	15¾—16¼
No. 2 heavy copper and wire	14¾—15¼
Light copper	13¾—14¼
Auto radiators (unswaged)	8½—9
No. 1 composition	10½—11
No. 1 composition turnings ..	10 —10½
Clean red car boxes	9 —9½
Cocks and faucets	8½—9
Mixed heavy yellow brass	7 —7½
Old rolled brass	7 —7½
Brass pipe	8 —8½
New soft brass clippings	11 —11½
Brass rod ends	9½—10
No. 1 brass rod turnings	8½—9

Aluminum

Alum. pistons free of struts ..	3½—4
Aluminum crankcases	5 —5½
2S aluminum clippings	8 —8½
Old sheet & utensils	5½—6
Mixed borings and turnings ..	—2
Misc. cast aluminum	5 —5½
Dural clips (24S)	5 —5½

Zinc

New zinc clippings	6 —6½
Old zinc	4½—4¾
Zinc routings	1½—2
Old die cast scrap	2½—3

Nickel and Monel

Pure nickel clippings	15½—17½
Clean nickel turnings	14 —15
Nickel anodes	16 —17
Nickel rod ends	17 —18
New Monel clippings	10 —10½
Clean Monel turnings	7 —8
Old sheet Monel	9½—10
Old Monel castings	7½—8
Inconel clippings	8 —8½
Nickel silver clippings, mixed ..	7½—8
Nickel silver turnings, mixed ..	5½—6

Lead

Soft scrap lead	10½—11
Battery plates (dry)	5 —5½

Magnesium Alloys

Segregated solids	6½—7
Castings	4½—5½

Miscellaneous

Block tin	63 —65
No. 1 pewter	48 —50
No. 1 auto babbitt	38 —40
Mixed common babbitt	11½—12
Solder joints	12 —13
Siphon tops	38 —39
Small foundry type	13 —13½
Monotype	12 —12½
Lino and stereotype	11½—12
Electrotype	9½—10
New type shell cuttings	11 —11½
Clean hand picked type shells ..	4½—5
Lino and stereo dross	5 —5½
Electro dross	3 —3½

Lead Products

(Cents per lb)

F.o.b. shipping point freight collect. Freight equalized with nearest free delivery point.	
Full lead sheets	18.25
Cut lead sheets	18.75
Lead pipe, manufacturing point ..	17.50
Lead traps and bends	List +42%
Combination lead and iron bends and ferrules, also combination lead and iron ferrules	List +42%
Lead wool	19.50

Steelmaking Grades Again Break Sharply

New York

••• Led off by a drop to \$38 a ton for heavy melting steel scrap at Pittsburgh, the nation's scrap markets were again off sharply this week. The Pittsburgh drop amounted to \$3.50 for the week. Chicago's average heavy steel scrap price was down \$1.50 to \$39; Philadelphia's heavy scrap was down \$2.50 to a top of \$37.50.

In some districts mills are still out of the market and taking scrap at high prices on old orders. Mill offers and brokers' buying prices have established the Buffalo heavy melting price at a top of \$40, down \$3 from last week.

It is apparent that the prevailing decline in scrap prices is bringing out reasonably large tonnages on existing contracts and as a result mills are not being forced to hurry into the market with new orders in order to maintain minimum scrap reserves. Scrap dealers, on the other hand, are not reported to be anxiously throwing scrap on the market as their reserves are not reported to be large.

While weakness has been shown in cast grades during the week, price declines have not been sharp in these grades and the long term shortage is continuing and is making itself felt. Low phos scrap prices have declined in most markets to the same extent as heavy melting but railroad specialties are showing relative strength.

PITTSBURGH—A purchase this week of heavy melting scrap at \$38 a ton continued the declining trend in scrap prices started 3 weeks ago. At the time the sale was made, both the brokers' buying price and the consumers' delivered price was \$38 a ton, brokers being unable to purchase at a lower figure. However, the condition is temporary and as news of the drop in the market spreads, broker buying prices will fall off proportionately. Despite the weakness in price there are still substantial orders out for higher prices and these will tend to cushion the decline—at least until these orders are filled. Scrap movement has accelerated, mainly because of the weakness in price. Railroad offerings have been allocated at under top bid prices, so the quoted prices represent levels at which the scrap moved rather than top bids for the material.

CHICAGO—Activity was rather limited on new business last week. Tonnages sold at the new price were not large and all concerned seemed to be marking time awaiting clarification of market conditions. Shipments have been good with two mills in the area able to lay some material in inventory. Although railroad specialties broke a little these prices for the most part indicate a firmness not shown by the rest of the market. Cast is still in great demand with the foundries hungry for practically all grades.

PHILADELPHIA — Heavy melting grades declined \$2.50 in this district during the past week when mills reentered the market on a moderate scale. Scrap shipments are continuing at fair volume on outstanding orders. Mills are reported to be continuing to test the strength of the market in anticipation of further price reductions. However, reports indicate that no mill in this area is in a position to remain out of the scrap market for an extended period. Turnings grades and cast scrap dropped \$1.50. Low phos grades dropped \$3. Railroad specialties declined \$1.

NEW YORK—Brokers dropped their buying price for heavy melting steel another \$1 a ton this week. While shipments have not been heavy it is felt in the trade that most dealers are moving as much as they can for fear there may be a further price break. Business was not large at the new low price because some yards still have some higher priced business to ship. Cast grades have turned weaker.

DETROIT—Skidding scrap prices were again featured in the past week. Brokers were offering tonnages freely and the only reason that more buying was not done by consumers was that they felt they could do better by waiting a little longer. Cast scrap as yet has not shown the same weakness as openhearth grades but indications are that this market too will soon show definite weakness.

CLEVELAND — Last week's market break has widened rapidly with buying by major consumers here and in the Valley and brokers covering on old orders. In some cases, brokers and dealers are willing to pay more than mills for a given tonnage of a given grade, such as low phos in the Valley. Present orders, which are not going to be canceled, according to trade sources, will probably last until Sept. 10, when another test of prices will take place.

BOSTON — Going market for heavy steel is \$30 to \$31 a ton f.o.b., down about \$2 for the week and out of line with the Pittsburgh market. Quotations mean little, however. Many brokers and yards quit

because of heat; collections by yards the past week were very light; steel mills are out of the market. Producers of turnings and borings turned out less than 50 per cent of their normal amounts the past week. Cast prices hold despite lack of buying by consumers.

BUFFALO — Openhearth scrap prices sagged \$3 below the peak in the absence of new buying this week with (No. 1) heavy melting listed at \$39 to \$40 on the basis of brokerage transactions. Sentiment was mixed and ideas of prices varied widely. One trader said mill consumers had put out feelers indicating a willingness to pay \$40 but that holders of \$43 contracts wanted to fill these orders before making new commitments at lower prices. Low phos plate and rail scrap were lower in sympathy with openhearth grades.

ST. LOUIS—Steel mills in the St. Louis industrial district came into the market last weekend with a price of \$38.50 to \$39.50 for No. 2 heavy melting steel but sales were limited. The price is for 30 days. The movement to the market has been a little better. Railroad lists: Louisville and Nashville, 5400 tons of which only a small part is expected to reach this district and St. Louis-San Francisco 32 carloads. The rerolling rail price is based on small lots but a heavy tonnage probably would bring a much higher price.

CINCINNATI—Although a shortage of scrap continues in this area, consumers are successfully exerting a depressing effect upon prices. As a result the entire list is off \$2 a ton. On the new basis dealers indicate that all the scrap available is moving on contracts but brokers are wary of speculative tonnages.

BIRMINGHAM—The market tone is downward here, with a \$3 a ton price break quotable in the heavy melting steel grades based on broker transactions. There is talk of a \$35 top for openhearth scrap but no sales were made early this week to confirm this figure.

TORONTO — Despite the advance in price of cast scrap to \$32 to \$33 per gross ton delivered consuming pants, and dealers offering \$30 a ton, there has been comparatively little improvement in offerings. Local dealers state that only small tonnage of iron scrap are appearing.

WAA Reports Scrap Sales

Washington

••• In an effort to help alleviate the steel scrap shortage, WAA has processed and sold more than 159,000 gross tons of ferrous scrap during the four-month period of March through June, agency officials said last week.

IRON AND STEEL SCRAP PRICES

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	.....	\$38.00
RR. hvy. melting	.....	41.00 to \$42.00
No. 2 hvy. melting	.....	38.00
RR. scrap rails	.....	46.00 to 46.50
Rails 2 ft. and under	.....	49.00 to 50.00
No. 1 comp'd bundles	.....	38.00
Hand bld. new shts.	.....	38.00
Hvy. axle turn.	.....	36.00 to 37.00
Hvy. steel forge turn.	.....	36.00 to 37.00
Mach. shop turn.	.....	32.50 to 33.00
Shoveling turn.	.....	34.50 to 35.00
Mixed bor. and turn.	.....	32.50 to 33.00
Cast iron borings	.....	33.50 to 34.00
No. 1 cupola cast.	.....	42.00 to 43.00
Hvy. breakable cast.	.....	37.00 to 37.50
Malleable	.....	52.00 to 53.00
RR. knuck and coup.	.....	47.50 to 48.00
RR. coil springs	.....	47.50 to 48.00
RR. leaf springs	.....	47.50 to 48.00
Rolled steel wheels	.....	47.50 to 48.00
Low phos.	.....	45.00 to 45.50

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	.....	\$38.50 to \$39.00
No. 2 hvy. melting	.....	38.50 to 39.00
No. 1 bundles	.....	38.50 to 39.00
No. 2 dealers' bundles	.....	38.50 to 39.00
Bundled mach. shop turn.	.....	38.50 to 39.00
Galv. bundles	.....	36.50 to 37.00
Mach. shop turn.	.....	33.50 to 34.00
Short shov. turn.	.....	35.50 to 36.00
Cast iron borings	.....	34.50 to 35.00
Mix. borings & turn.	.....	33.50 to 34.00
Low phos. hvy. forge.	.....	43.50 to 44.00
Low phos. plates	.....	41.00 to 41.50
No. 1 RR. hvy. melt.	.....	41.00 to 42.00
Rerolling rails	.....	47.00 to 48.00
Miscellaneous rails	.....	43.00 to 44.00
Angles & splice bars	.....	44.50 to 45.50
Locomotive tires, cut	.....	42.00 to 43.00
Cut bolster & side frames	.....	44.00 to 45.00
Standard stl. car axles	.....	48.00 to 49.00
No. 3 steel wheels	.....	43.00 to 44.00
Couplers & knuckles	.....	45.00 to 45.50
Malleable	.....	60.00 to 61.00
No. 1 mach. cast.	.....	47.00 to 48.00
Rails 2 ft. and under	.....	48.00 to 48.50
No. 1 agricul. cast.	.....	43.00 to 44.00
Hvy. breakable cast.	.....	39.00 to 41.00
RR. grate bars	.....	40.50 to 41.50
Cast iron brake shoes	.....	43.00 to 44.00
Cast iron carwheels	.....	42.00 to 42.50

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	.....	\$33.00 to \$34.00
No. 2 hvy. melting	.....	33.00 to 34.00
No. 1 bundles	.....	33.00 to 34.00
No. 2 bundles	.....	33.00 to 34.00
Mach. shop turn.	.....	28.50 to 29.00
Shoveling turn.	.....	30.50 to 31.00
Cast iron borings	.....	28.50 to 29.00
Mixed bor. & turn.	.....	28.00 to 29.00
Low phos. plate	.....	39.00 to 40.00
No. 1 cupola cast.	.....	44.00 to 45.00
Hvy. breakable cast.	.....	35.00 to 36.00
Scrap rails	.....	39.00 to 40.00

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars:

No. 1 hvy. melting	.....	\$30.00 to \$31.00
No. 2 hvy. melting	.....	30.00 to 31.00
Nos. 1 and 2 bundles	.....	30.00 to 31.00
Busheling	.....	30.00 to 31.00
Shoveling turn.	.....	27.00 to \$27.50
Machine shop turn.	.....	25.00 to 25.50
Mixed bor. & turn.	.....	25.00 to 25.50
C'l'n cast. chem. bor.	.....	27.00 to 28.00
No. 1 machinery cast.	.....	44.00 to 45.00
No. 2 machinery cast.	.....	44.00 to 45.00
Heavy breakable cast.	.....	44.00 to 45.00
Stove plate	.....	44.00 to 45.00

DETROIT

Per gross ton, brokers' buying prices, f.o.b. cars:

No. 1 hvy. melting	.....	\$34.00 to \$35.00
No. 2 hvy. melting	.....	34.00 to 35.00
No. 1 bundles	.....	34.00 to 35.00
New busheling	.....	34.00 to 35.00
Flashings	.....	34.00 to 35.00
Mach. shop turn.	.....	27.00 to 28.00
Shoveling turn.	.....	28.00 to 29.00
Cast iron borings	.....	28.00 to 29.00
Mixed bor. & turn.	.....	29.00 to 30.00
Low phos. plate	.....	38.00 to 39.00
No. 1 cupola cast.	.....	38.00 to 39.00
Hvy. breakable cast.	.....	31.00 to 32.00
Stove plate	.....	32.00 to 34.00
Automotive cast.	.....	38.00 to 40.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	.....	\$36.50 to \$37.50
No. 2 hvy. melting	.....	36.50 to 37.50
No. 1 bundles	.....	36.50 to 37.50
No. 2 bundles	.....	36.50 to 37.50
Mach. shop turn.	.....	28.50 to 29.50
Shoveling turn.	.....	28.50 to 29.50
Mixed bor. & turn.	.....	28.50 to 29.50
Clean cast chemical bor.	.....	32.00 to 33.00
No. 1 cupola cast.	.....	46.50 to 47.50
Hvy. breakable cast.	.....	43.50 to 44.50
Cast. charging box.	.....	43.50 to 44.50
Clean auto cast.	.....	46.50 to 47.50
Hvy. axle forge turn.	.....	36.50 to 37.50
Low phos. plate	.....	40.00 to 41.00
Low phos. punchings	.....	40.00 to 41.00
Low phos. bundles	.....	39.00 to 40.00
RR. steel wheels	.....	44.00 to 45.00
RR. coil springs	.....	44.00 to 45.00
RR. malleable	.....	53.00 to 60.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	.....	\$39.50 to \$40.50
No. 2 hvy. melting	.....	38.50 to 39.50
Bundled sheets	.....	38.00 to 39.00
Mach. shop turn.	.....	31.25 to 32.25
Locomotive tires, uncut.	.....	41.00 to 42.00
Mis. std. sec. rails	.....	42.00 to 43.00
Rerolling rails	.....	45.00 to 46.00
Steel angle bars	.....	40.00 to 41.00
Rails 3 ft. and under	.....	45.00 to 46.00
RR. steel springs	.....	45.00 to 46.00
Steel car axles	.....	43.00 to 44.00
Grate bars	.....	36.00 to 37.00
Brake shoes	.....	38.00 to 39.00
Malleable	.....	54.00 to 56.00
Cast iron car wheels	.....	42.00 to 43.00
No. 1 machinery cast.	.....	43.00 to 44.00
Hvy. breakable cast	.....	35.00 to 36.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	.....	\$35.00 to \$36.00
No. 2 hvy. melting	.....	35.00 to 36.00
No. 2 bundles	.....	35.00 to 36.00
No. 1 busheling	.....	35.00 to 36.00
Long turnings	.....	24.00 to 25.00
Shoveling turnings	.....	27.50 to 28.00
Cast iron borings	.....	26.50 to 27.00
Bar crops and plate	.....	38.00 to 38.50
Structural and plate	.....	38.00 to 38.50
No. 1 cupola cast.	.....	44.00 to 45.00
Stove plate	.....	42.00 to 42.50
No. 1 RR. hvy. melt.	.....	36.00 to 37.00
Steel axles	.....	38.00 to 39.00
Scrap rails	.....	37.50 to 38.00
Rerolling rails	.....	38.50 to 39.00
Angles & splice bars	.....	38.50 to 39.00
Rails 3 ft. & under	.....	38.50 to 39.00
Cast iron carwheels	.....	35.00 to 36.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	.....	\$40.00 to \$40.50
No. 2 hvy. melting	.....	40.00 to 40.50
Mach. shop turn.	.....	32.00 to 34.00
Short shov. turn.	.....	34.00 to 35.00
Cast iron borings	.....	33.00 to 34.00
Low phos.	.....	44.00 to 45.00

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	.....	\$32.00
No. 2 hvy. melting	.....	30.00
No. 2 bundles	.....	30.00
Comp. galv. bundles	.....	30.00
Mach. shop turn.	.....	25.00 to 26.00
Mixed bor. & turn.	.....	25.00 to 26.00
Shoveling turn.	.....	27.00 to 28.00
No. 1 cupola cast.	.....	39.00 to 40.00
Hvy. breakable Cast.	.....	39.00 to 40.00
Charging box cast.	.....	39.00 to 40.00
Stove plate	.....	39.00 to 40.00
Clean auto cast.	.....	39.00 to 40.00
Unstrip. motor blks.	.....	36.50 to 37.50
C'l'n chem. cast bor.	.....	27.00 to 28.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	.....	\$39.00 to \$40.00
No. 2 hvy. melting	.....	39.00 to 40.00
No. 1 bundles	.....	39.00 to 40.00
No. 2 bundles	.....	39.00 to 40.00
No. 1 busheling	.....	39.00 to 40.00
Mach. shop turn.	.....	30.00 to 31.00
Shoveling turn.	.....	32.00 to 33.00
Cast iron borings	.....	30.00 to 31.00
Mixed bor. & turn.	.....	30.00 to 31.00
No. 1 cupola cast.	.....	40.00 to 42.00
Charging box cast.	.....	36.00 to 37.00
Stove plate	.....	39.00 to 40.00
Clean auto cast.	.....	40.00 to 42.00
Small indl. malleable	.....	39.00 to 41.00
RR. malleable	.....	46.00 to 52.00
Lqw phos. plate	.....	42.00 to 43.00
Scrap rails	.....	37.00 to 38.00
Rails 3 ft. & under	.....	42.00 to 43.00
RR. steel wheels	.....	42.00 to 43.00
Cast iron carwheels	.....	42.00 to 43.00
RR. coil & leaf spgs.	.....	42.00 to 43.00
RR. knuckles & coup.	.....	42.00 to 43.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	.....	\$39.00 to \$39.50
No. 2 hvy. melting	.....	39.00 to 39.50
No. 1 bundles	.....	39.00 to 39.50
No. 2 bundles	.....	39.00 to 39.50
No. 1 busheling	.....	39.00 to 39.50
Drop forge flashings	.....	39.00 to 39.50
Mach. shop turn.	.....	32.00 to 32.50
Shoveling turn.	.....	33.00 to 34.00
Steel axle turn.	.....	39.00 to 39.50
Cast iron borings	.....	33.00 to 34.00
Mixed bor. & turn.	.....	33.00 to 34.00
Low phos.	.....	41.00 to 42.00
No. 1 machinery cast.	.....	47.00 to 47.50
Malleable	.....	54.00 to 55.00
RR. Cast.	.....	47.00 to 47.50
Railroad grate bars	.....	42.00 to 44.00
Stove plate	.....	42.00 to 44.00
RR. hvy. melting	.....	45.00 to 43.00
Rails 3 ft. & under	.....	47.00 to 48.00
Rails 18 in. & under	.....	43.00 to 49.00

SAN FRANCISCO

Per gross ton f.o.b. shipping point

No. 1 hvy. melting	.....	\$22.00
No. 2 hvy. melting	.....	22.00
No. 2 bales	.....	22.00

Per gross ton delivered to consumer

No. 3 bales	.....	\$16.50
Mach. shop turn.	.....	13.00
Elec. furn. 1 ft. und.	.....	26.00
No. 1 cupola cast.	.....	\$32.00 to 33.00
RR. hvy. melting	.....	23.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	.....	\$22.50
No. 2 hvy. melting	.....	22.50
No. 1 bales	.....	22.50
No. 2 bales	.....	22.50
No. 3 bales	.....	16.00
Mach. shop turn.	.....	14.50
No. 1 cupola cast.	.....	\$32.00 to 33.00
RR. hvy. melting	.....	23.00

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. hvy. melt.	.....	\$20.00 to \$22.00
Elec. furn. 1 ft. und.	.....	\$25.50 to 27.00
No. 1 cupola cast.	.....	29.00
RR. hvy. melting	.....	23.00

HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point

Heavy melting	.....	\$17.50*
No. 1 bundles	.....	17.50*
No. 2 bundles	.....	17.00*
Mixed steel scrap	.....	15.50*
Rails, remelting	.....	18.50*
Rails, rerolling	.....	21.50*
Bushelings	.....	13.00*
Mixed borings & turnings	.....	12.50*
Electric furnace bundles	.....	20.50*
Manganese steel scrap	.....	30.00*
No. 1 cast	.....	19.00*
Stove plate	.....	17.50*
Car wheels, cast	.....	19.50*
Malleable iron	.....	16.00*

* Ceiling price.

Comparison of Prices . .

Advances over past week in Heavy Type, declines in Italics. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel: (cents per pound)	Aug. 19, 1947	Aug. 12, 1947	July 22, 1947	Aug. 20, 1946
Hot-rolled sheets	2.80	2.80	2.50	2.425
Cold-rolled sheets	3.55	3.55	3.20	3.275
Galvanized sheets (10 ga.)	3.95	3.95	3.55	4.05*
Hot-rolled strip	2.80	2.80	2.50	2.45
Cold-rolled strip	3.55	3.55	3.20	3.05
Plates	2.95	2.95	2.65	2.50
Plates wrought iron	6.85	6.85	5.95	4.112
Stain's c-r strip (No. 302) *24 ga	30.30	30.30	30.30	30.30
Tin and Terneplate: (dollars per base box)				
Tinplate, standard cokes	\$5.75	\$5.75	\$5.75	\$5.00
Tinplate, electro (0.50 lb)	5.05	5.05	5.05	4.50
Special coated mfg. ternes	4.90	4.90	4.90	4.30
Bars and Shapes: (cents per pound)				
Merchant bars	2.90	2.90	2.60	2.50
Cold-finished bars	3.55	3.55	3.20	3.10
Alloy bars	3.30	3.30	3.05	2.92
Structural shapes	2.80	2.80	2.50	2.35
Stainless bars (No. 302)	26.00	26.00	26.00	25.97
Wrought iron bars	7.15	7.15	6.15	4.76
Wire and Wire Products: (cents per pound)				
Bright wire	3.55	3.55	3.30	3.05
Wire nails	4.25	4.25	3.75	3.75
Rails: (dollars per 100 lb)				
Heavy rails	\$2.50	\$2.50	\$2.50	\$43.39*
Light rails	2.85	2.85	2.85	49.18*
*per net ton				
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	\$45.00	\$45.00	\$42.00	\$39.00
Sheet bars	66.00	59.00	53.00	38.00
Slabs, rerolling	45.00	45.00	42.00	39.00
Forging Billets	55.00	55.00	50.00	47.00
Alloy blooms, billets, slabs	66.00	66.00	61.00	58.43
Wire Rods and Skelp: (cents per pound)				
Wire rods	2.80	2.80	2.55	2.30
Skelp	2.60	2.60	2.35	2.05

Pig Iron: (per gross ton)	Aug. 19, 1947	Aug. 12, 1947	July 22, 1947	Aug. 20, 1946
No. 2, foundry, Phila.	\$41.22	\$41.22	\$39.22	\$30.43
No. 2, Valley furnace	36.50	36.50	36.50	28.50
No. 2, Southern Cin'ti.	39.75	38.25	38.25	27.80
No. 2, Birmingham	34.88	33.38	33.38	24.88
No. 2, foundry, Chicago†	36.00	36.00	36.00	28.50
Basic del'd Philadelphia	40.72	40.72	39.89	29.93
Basic, Valley furnace	36.00	36.00	36.00	28.00
Malleable, Chicago†	36.50	36.50	36.50	28.50
Malleable, Valley	36.50	36.50	36.50	28.50
Charcoal, Chicago	49.49	49.49	48.49	42.34
Ferromanganese‡	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.
‡ For carlots at seaboard.

Scrap: (per gross ton)	Aug. 19, 1947	Aug. 12, 1947	July 22, 1947	Aug. 20, 1946
Heavy melt'g steel, P'gh.	\$38.00	\$41.50	\$40.25	\$20.00
Heavy melt'g steel, Phila.	37.00	39.50	39.50	18.75
Heavy melt'g steel, Ch'go	38.75	40.25	40.25	18.75
No.1, hy. comp. sheet, Det.	34.50	37.50	34.00	17.32
Low phos. Youngs'n	44.50	43.50	43.25	22.50
No. 1, cast, Pittsburgh	42.50	41.50	39.75	20.00
No. 1, cast, Philadelphia	47.00	48.50	47.50	20.00
No. 1, cast, Chicago	47.50	51.25	47.50	20.00

Coke, Connellsville: (per net ton at oven)	Aug. 19, 1947	Aug. 12, 1947	July 22, 1947	Aug. 20, 1946
Furnace coke, prompt	\$12.00	\$12.00	\$12.00	\$7.50
Foundry coke, prompt	13.75	13.75	13.75	8.50

Nonferrous Metals: (cents per pound to large buyers)	Aug. 19, 1947	Aug. 12, 1947	July 22, 1947	Aug. 20, 1946
Copper, electro., Conn.	21.50	21.50	21.50	14.375
Copper, Lake, Conn.	21.625	21.625	21.625	14.375
Tin, Straits, New York	80.00	80.00	80.00	52.00
Zinc, East St. Louis	10.50	10.50	10.50	8.25
Lead, St. Louis	14.80	14.80	14.80	8.10
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	37.67	37.67	37.67	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	33.00	33.00	33.00	14.50

In accordance with usual practice, THE IRON AGE finished steel composite price has been revised this week, following receipt of second quarter 1947 shipment data. While no price changes have been made since Aug. 5, 1947, the change in the pattern of shipments produces a composite price slightly higher than that of 3.17956¢, the figure used last week which was based on first quarter 1947 shipments. Shipment data by American Iron & Steel Institute.

Composite Prices . .

FINISHED STEEL				PIG IRON				SCRAP STEEL				
Aug. 19, 1947.....3.19141¢ per lb.....				.....\$37.35 per gross ton.....				.....\$37.92 per gross ton.....				
One week ago.....3.19141¢ per lb.....				.....\$36.52 per gross ton.....				.....\$40.42 per gross ton.....				
One month ago.....2.88239¢ per lb.....				.....\$36.18 per gross ton.....				.....\$40.00 per gross ton.....				
One year ago.....2.70711¢ per lb.....				.....\$28.13 per gross ton.....				.....\$19.17 per gross ton.....				
HIGH		LOW		HIGH		LOW		HIGH		LOW		
1947....	3.19141¢	Aug. 5	2.87118¢	Jan. 7	\$37.35	Aug. 19	\$30.14	Jan. 7	\$41.67	Aug. 5	\$29.50	May 20
1946....	2.83599¢	Dec. 31	2.54490¢	Jan. 1	30.14	Dec. 10	25.37	Jan. 1	31.17	Dec. 24	19.17	Jan. 1
1945....	2.44104¢	Oct. 2	2.38444¢	Jan. 2	25.37	Oct. 23	23.61	Jan. 2	19.17	Jan. 2	18.92	May 22
1944....	2.30837¢	Sept. 5	2.21189¢	Oct. 5	\$23.61		\$23.61		19.17	Jan. 11	15.76	Oct. 24
1943....	2.29176¢		2.29176¢		23.61		23.61		\$19.17		\$19.17	
1942....	2.28249¢		2.28249¢		23.61		23.61		19.17		19.17	
1941....	2.43078¢		2.43078¢		\$23.61	Mar. 20	\$23.45	Jan. 2	\$22.00	Jan. 7	\$19.17	Apr. 10
1940....	2.30467¢	Jan. 2	2.24107¢	Apr. 16	23.45	Dec. 23	22.61	Jan. 2	21.83	Dec. 30	16.04	Apr. 9
1939....	2.35367¢	Jan. 3	2.26689¢	May 16	22.61	Sept. 19	20.61	Sept. 12	22.50	Oct. 3	14.08	May 16
1938....	2.58414¢	Jan. 4	2.27207¢	Oct. 18	23.25	June 21	19.61	July 6	15.00	Nov. 22	11.00	June 7
1937....	2.58414¢	Mar. 9	2.32263¢	Jan. 4	23.25	Mar. 9	20.25	Feb. 16	21.92	Mar. 30	12.67	June 9
1936....	2.32263¢	Dec. 28	2.05200¢	Mar. 10	19.74	Nov. 24	18.73	Aug. 11	17.75	Dec. 21	12.67	June 8
1935....	2.07642¢	Oct. 1	2.06492¢	Jan. 8	18.84	Nov. 5	17.83	May 14	13.42	Dec. 10	10.33	Apr. 29
1934....	2.15367¢	Apr. 24	1.95757¢	Jan. 2	17.90	May 1	16.90	Jan. 27	13.00	Mar. 13	9.50	Sept. 25
1933....	1.95578¢	Oct. 3	1.75836¢	May 2	16.90	Dec. 5	13.56	Jan. 3	12.25	Aug. 8	6.75	Jan. 3
1932....	1.89196¢	July 5	1.83901¢	Mar. 1	14.81	Jan. 5	13.56	Dec. 6	8.50	Jan. 12	6.43	July 5
1931....	1.99626¢	Jan. 13	1.86586¢	Dec. 29	15.90	Jan. 6	14.79	Dec. 15	11.33	Jan. 6	8.50	Dec. 29
1930....	2.25488¢	Jan. 7	1.97319¢	Dec. 9	18.21	Jan. 7	15.90	Dec. 16	15.00	Feb. 18	11.25	Dec. 9
1929....	2.31773¢	May 28	2.26498¢	Oct. 29	18.71	May 14	18.21	Dec. 17	17.58	Jan. 29	14.08	Dec. 8

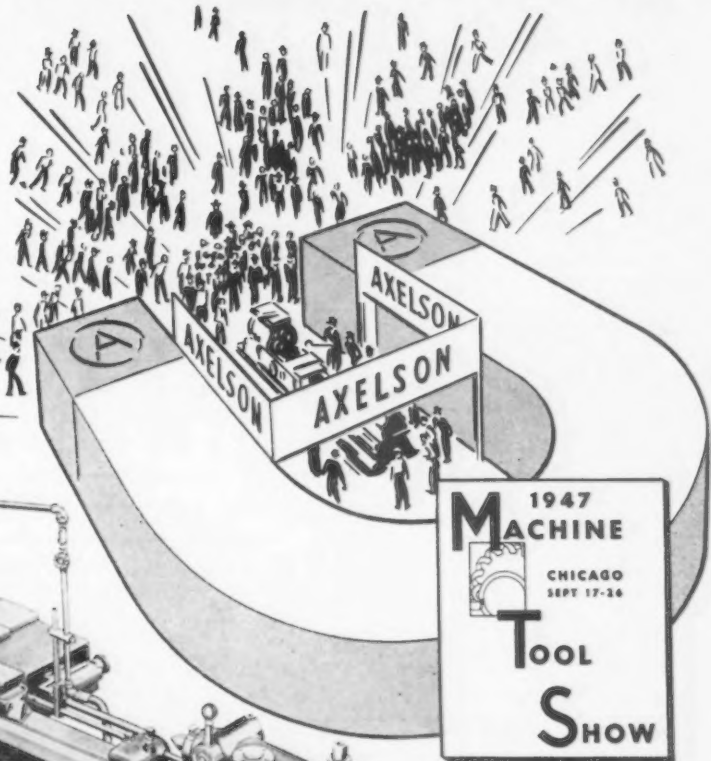
Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Powerful Attraction!

The natural magnetism of *Axelson's* operating lathe exhibit, at Booth 232-274, Chicago Machine Tool Show, in September, is directed towards the metal turning industry. Don't miss the opportunity to see this versatile, accurate, economical-to-operate machine in action... And *what a show!* The first in 12 strenuous production years, with 500,000 square feet of floor space devoted to exhibits... Follow the crowd to the Axelson exhibit there and you will be well repaid.



and here's the
newest **AXELSON**
number! *The Hollow*
Spindle "Oil Country" Lathe!

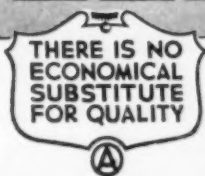
Exceeding all expectations of Axelson customers, the Hollow Spindle Lathes, with heavy duty geared head, are making new Axelson satisfaction records... Made in two sizes, the 20" lathe—with 8 $\frac{7}{8}$ " hole in spindle—has 24 speeds: The 25" lathe—with 11" hole in spindle—has 16 speeds. The same "quality first" standards which have distinguished Axelson's time-tested heavy duty lathes appear in the hollow spindle job. The hollow spindle lathes are primarily designed to meet special requirements of the oil industry with its tool-joint jobs and other long members used in drilling and pumping.

Axelson Lathes, of various lengths, are manufactured in 14, 16, 18, 20, 25, and 32-inch sizes. Also 20 and 25-inch hollow spindle "Oil Country" Lathes.

AXELSON MANUFACTURING COMPANY

6160 S. Boyle Ave. (Box 98, Vernon Station), Los Angeles 11, Calif. • 50 Church St., New York City 7
3844 Walsh St., St. Louis, Mo.

AXELSON



Lathes

DEPENDABLE FOR OVER A QUARTER CENTURY

THE IRON AGE, August 21, 1947—147

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 25c above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 20,000 lb to 89,999 lb. (9) Carload lot in manufacturing trade. (10) Delivered Los Angeles only. (11) Boxed. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only: includes 3 pct freight tax. (14) Delivered Kaiser Co. prices: includes 3 pct freight tax. (15) to 0.035 to 0.075 in. thick by 3/4 to 3 1/2 in. wide. (16) Spot market as high as \$92 gross ton. (17) Delivered Los Angeles: add 1/2c per 100 lb for San Francisco. (18) Slab prices subject to negotiation in most cases. Some producers charge (19) \$5 more, (20) \$3 more, (21) \$1 more. Some producers charge (22) 0.05¢ less, (23) 0.10¢ less, (24) 0.20¢ less.

Basing Points	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	San Franc- isco, Los Angeles, Seattle	DELIVERED TO					
												Detroit	New York	Phila- delphia			
INGOTS																	
Carbon, rerolling	(\$36.00 f. o. b. mill) (Spot market as high as \$80 gross ton)																
Carbon, forging	\$46.00																
Alloy	\$56.00															(Canton = \$56.00)	
BILLETS, BLOOMS, SLABS																	
Carbon, rerolling ¹⁸	\$45.00 ¹⁹	\$45.00 ¹⁹	\$45.00 ¹⁹	\$50.00	\$45.00 ¹⁹	\$45.00 ¹⁹	\$50.00							\$48.00 ¹⁹			
Carbon, forging billets	\$55.00 ²⁰	\$55.00 ²⁰	\$55.00 ²⁰	\$58.00	\$55.00 ²⁰	\$55.00 ²⁰	\$58.00							\$58.00 ²⁰		(Duluth = \$57.00)	
Alloy	\$66.00	\$66.00				\$66.00								\$69.00		(Bethlehem, Massillon, Canton = \$66.00)	
SHEET BARS¹⁶																	
PIPE SKELP	2.60¢ ²¹	2.65¢					2.60¢ ²¹	2.60¢ ²¹									
WIRE RODS	2.80¢ ²¹	2.80¢ ²¹		2.80¢ ²¹	2.85¢											(Worcester = 2.90¢ ²¹)	
SHEETS																	
Hot-rolled	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	3.175¢		(Ashland, Ky. = 2.80¢)	3.5417¢	2.95¢	3.09¢	3.00¢		
Cold-rolled ¹	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢	3.55¢		3.65¢	3.55¢			3.70¢	3.96¢	3.93¢		
Galvanized (10 gage)	3.95¢ ²³	3.95¢ ²³	3.95¢ ²³		3.95¢ ²³		3.95¢	3.95¢	4.05¢	3.95¢		4.62¢ ¹⁷		4.14¢	4.05¢		
Enameling (12 gage)	3.95¢ ²²	3.95¢ ²²	3.95¢ ²²	3.95¢			3.95¢		4.05¢	3.95¢			4.10¢ ²²	4.35¢	4.33¢		
Long ternes ² (10 gage)	4.05¢ ²⁴	4.05¢	4.05¢ ²⁴											4.45¢	4.41¢		
STRIP																	
Hot-rolled ³	2.80¢	2.80¢	2.80¢	2.80¢ ¹⁵	2.80¢		2.80¢						3.60¢ ¹⁷	2.95¢	3.23¢	3.18¢	
Cold-rolled ⁴	3.55¢	3.65¢		3.55¢			3.55¢						(Worcester = 3.75¢)	3.70¢	3.96¢	3.93¢	
Cooperage stock	3.10¢	3.10¢			3.10¢		3.10¢								3.39¢		
TINPLATE																	
Standard cokes, base box	\$5.75	\$5.75	\$5.75		\$5.85			\$5.85	\$5.85					(Warren, Ohio = \$5.75)	\$6.175	\$6.082 ¹¹	
Electro, box	0.25 lb. 0.50 lb. 0.75 lb.																Deduct 90¢ from standard coke base box price. Deduct 70¢ from standard coke base box price. Deduct 50¢ from standard coke base box price.
BLACKPLATE, 29 gage ⁵	3.90¢	3.90¢	3.90¢		4.00¢			4.00¢	4.00¢					4.29¢	4.20¢		
BLACKPLATE, CANMAKING																	
55 lb. to 70 lb. 75 lb. to 95 lb. 100 lb. to 118 lb.																	Deduct \$1.55 from standard coke base box. Deduct \$1.85 from standard coke base box. Deduct \$1.55 from standard coke base box.
TERNES, MFG., Special coated																	
																Deduct 85¢ from standard coke base box price.	
BARS																	
Carbon steel	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢							3.625¢ ¹⁷	3.05¢	3.31¢	3.28¢
Rail steel ⁶	Subject to negotiation because of fluctuating scrap prices.																
Reinforcing (billet) ⁷	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢						3.325¢ ¹⁷	3.04¢	2.95¢	
Reinforcing (rail)	Subject to negotiation because of fluctuating scrap prices.																
Cold-finished ⁸	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢								3.70¢	3.98¢	3.93¢	
Alloy, hot-rolled	3.30¢	3.30¢				3.30¢	3.30¢							(Bethlehem, Massillon, Canton = 3.30¢)	3.45¢	3.44¢	
Alloy, cold-drawn	4.10¢	4.10¢	4.10¢	4.10¢		4.10¢									4.25¢		
PLATE																	
Carbon steel ¹²	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢		2.95¢							(Coatesville = 3.15¢, Claymont = 3.15¢, Geneva, Utah = 3.125¢)	3.17¢	3.15¢	
Floor plates	4.20¢	4.20¢													4.60¢	4.58¢	
Alloy	3.80¢	3.80¢												(Coatesville = 4.50¢)	4.02¢	3.895¢	
SHAPES, Structural																	
	2.80¢	2.80¢	2.80¢		2.80¢	2.80¢								(Geneva, Utah = 2.975¢, Bethlehem = 2.80¢)	3.43¢ ¹⁰	3.00¢	2.94¢
SPRING STEEL, C-R																	
0.28 to 0.40 carbon	3.20¢			3.20¢										(Worcester = 3.40¢)			
0.41 to 0.60 carbon	4.70¢			4.70¢										(Worcester = 4.90¢)			
0.61 to 0.80 carbon	5.30¢			5.30¢										(Worcester = 5.50¢)			
0.81 to 1.00 carbon	6.80¢			6.80¢										(Worcester = 7.00¢)			
Over 1.00 carbon	9.10¢			9.10¢										(Worcester = 9.30¢)			
MANUFACTURERS' WIRE⁹																	
Bright	3.55¢	3.55¢		3.55¢	3.55¢									(Worcester = 3.65¢, Duluth = 3.60¢)	4.56¢ ¹³	3.96¢	3.93¢
Galvanized	Add proper size extra and galvanizing extra to Bright Wire Base																
Spring (high carbon)	4.60¢	4.60¢		4.60¢										(Worcester = 4.70¢, Duluth = 4.85¢) (Trenton = 4.85¢)	5.28¢ ¹³	4.66¢	4.595¢
PILING, Steel sheet																	
	3.30¢	3.30¢				3.30¢									3.71¢	3.69¢	

PRICES

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 448
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation		Subject to negotiation			
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.	Subject to negotiation		Subject to negotiation			
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading.	Subject to negotiation		Subject to negotiation			
Billets, P'gh, Chi, Canton, Watervliet, Syracuse, Balt.	Subject to negotiation		Subject to negotiation			
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville.	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville.	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet.	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton.	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi.	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt.	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown.	25.50	23.50	18.50	19.00	26.00	30.00
Strip, c-r, P'gh, Cleve, Newark, N. J., Reading, Canton, Youngstown.	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft. Wayne.	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton.	32.46	30.30	23.80	24.34	34.62	56.26
Rod, h-r, Syracuse.	27.05	25.97	20.02	20.56	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton (4 to 6 in.).	72.09	72.09	.....	68.49	.....	.....

TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, Ohio)

W	Cr	V	Mo	Co	Base Per lb
18	4	1	—	—	82¢
18	4	1	—	5	\$1.29
18	4	2	—	—	93¢
1.5	4	1.5	8	—	59¢
6	4	2	6	—	63¢
High-carbon-chromium*					47¢
Oil hardening manganese*					26¢
Special carbon*					24¢
Extra carbon*					20¢
Regular carbon*					17¢

Warehouse prices on and east of Mississippi are 2¢ per lb. higher; west of Mississippi, 4¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Field grade	4.50¢
Armature	4.80¢
Electrical	5.30¢
Motor	6.05¢
Dynamo	6.75¢
Transformer 72	7.25¢
Transformer 65	7.95¢
Transformer 58	8.65¢
Transformer 52	9.45¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb No. 1 O.H., per 100 lb.	\$2.75
Angle splice bars, 100 lb.	3.25
(F.o.b. basing points) per 100 lb	
Light rails (from billets)	\$3.10
Light rails (from rail steel), f.o.b. Williamsport, Pa.	3.45

Base per lb

Cut spikes	4.85¢
Screw spikes	6.90¢
Tie plate, steel	3.05¢
Tie plates, Pittsburg, Calif.	3.20¢
Track bolts	7.00¢
Track bolts, heat treated, to rail roads	7.25¢

Basing points, light rails, Pittsburgh, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio; Welton, W. Va.; St. Louis, Kansas City, Minnequa, Colo.; Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa.; Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa.; Richmond.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	\$7.05	\$14.10

CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless-clad No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	*24.00	*22.00
Nickel-clad 10 pct, f.o.b. Coatesville, Pa.	21.50	.....
Inconel-clad 10 pct, f.o.b. Coatesville.	30.00	.....
Monel-clad 10 pct, f.o.b. Coatesville.	29.00	.....
Aluminized steel Hot dip, 20 gage, f.o.b. Pittsburgh	.....	9.00

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Base Delivered per San Francisco	Base Delivered per Pittsburgh
Standard & coated nails	\$4.25†	\$5.33
Galvanized nails††	4.00†	5.08
Cut nails, carloads, Pittsburgh base	5.80*	.....

† 10¢ additional at Cleveland, 35¢ at Worcester. †† Plus \$2.75 per 100 lb galvanizing extra. *Less 20¢ to jobbers.

	Base per 100 lb	Base column
Annealed fence wire	\$4.20†	\$5.21
Annealed galv. fence wire	4.65†	5.66
†10¢ additional at Worcester.		

To the dealer f.o.b. Pittsburgh, Chicago, Birmingham

Woven wire fence*	91	114
Fence posts, carloads...	90†	...
Single loop bale ties	91	115
Galvanized barbed wire**	101	121
Twisted barbless wire...	101	...

* 15 1/2 gage and heavier. ** On 80-rod spools in carload quantities. †† Pittsburgh, Duluth.

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Aldecor	Corten	Deuble Strength No. 1	Dynalloy	HI Steel	Mayari R	Otiscoloy	Yoioy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngtown Sheet & Tube	Great Lakes Steel
Plates	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55
Sheets									
Hot-rolled	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Cold-rolled	5.30	5.30	5.30	.....	5.30	5.30	5.30	5.30	5.30
Galvanized	.....	5.85	.....	.....	.....	6.00	.....	.....	.....
Strip									
Hot-rolled	4.30	4.30	4.30	.....	4.30	4.30	4.30	4.30	4.30
Cold-rolled	.....	5.30	.....	.....	5.30	5.30	5.30	5.30	5.30†
Shapes	.....	4.30	.....	.....	4.30	4.30	4.30	4.30	.....
Beams	.....	4.30	.....	.....	4.30	.....	.....	.....	.....
Bars									
Hot-rolled	4.45	4.45	4.45	.....	.....	4.45	4.45	4.45	4.45
Cold-rolled	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bar shapes	.....	4.45	.....	.....	4.45	4.45	4.45	4.45	.....

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh and Lorain, steel butt-weld and seamless. Others f.o.b. Pittsburgh only. Base price, \$200.00 per net ton

Standard, threaded & coupled

Steel, butt-weld	Black	Galv.
1/2-in.	50 1/2	34 1/2
3/4-in.	53 1/2	38 1/2
1-in.	56	41 1/2
1 1/4-in.	56 1/2	42
1 1/2-in.	57	42 1/2
2-in.	57 1/2	43
2 1/2 and 3-in.	58	43 1/2
Wrought iron, butt-weld		
1/2-in.	+ 7	+ 29
3/4-in.	2 1/2	+ 19
1 and 1 1/4-in.	8	+ 11
1 1/2-in.	13 1/2	+ 7 1/2
2-in.	14	+ 7

Steel, lap-weld		
2-in.	49	34
2 1/2 and 3-in.	52	37
3 1/2 to 6-in.	54	39

Steel, seamless		
2-in.	48	33
2 1/2 and 3-in.	51	36
3 1/2 to 6-in.	53	38

Wrought iron, lap-weld		
2-in.	5 1/2	+ 14 1/2
2 1/2 to 3 1/2-in.	8	+ 10 1/2
4-in.	12	+ 5
4 1/2 to 8-in.	10	+ 6 1/2

Extra Strong, plain ends

Steel, butt-weld		
1/2-in.	49 1/2	35
3/4-in.	53 1/2	39
1-in.	55 1/2	42
1 1/4-in.	56	42 1/2
1 1/2-in.	56 1/2	43
2-in.	57	43 1/2
2 1/2 and 3-in.	57 1/2	44
Wrought iron, butt-weld		
1/2-in.	+ 2 1/2	+ 23
3/4-in.	3 1/2	+ 17
1 to 2-in.	13	+ 7

Steel, lap-weld		
2-in.	48	34
2 1/2 and 3-in.	52	38
3 1/2 to 6-in.	55 1/2	41 1/2

Steel, seamless		
2-in.	47	33
2 1/2 and 3-in.	51	37
3 1/2 to 6-in.	52 1/2	40 1/2

Wrought iron, lap-weld		
2-in.	8 1/2	+ 11
2 1/2 to 4-in.	17 1/2	+ 1 1/2
4 1/2 to 6-in.	13	+ 5

Basing discounts for standard pipe are for threads and couplings. For threads only, butt-weld, lap-weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt-weld, lap-weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap-weld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all butt-weld. On butt-weld and lap-weld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft, f.o.b. Pittsburgh in carload lots, cut length 1/2 to 2 1/2 ft, inclusive.

OD Gage	Seamless		Electric Weld	
	Hot-Drawn	Cold-Drawn	Hot-Drawn	Cold-Drawn
2	13	\$16.67	\$19.99	\$16.17
2 1/2	12	22.42	26.87	21.75
3	12	24.93	29.90	24.18
3 1/2	11	31.17	37.39	30.23
4	10	38.69	46.38	37.53

CAST IRON WATER PIPE

	Per net ton
6-in. to 24-in. del'd Chicago	\$85.06
6-in. to 24-in. del'd New York	83.30
6-in. to 24-in., Birmingham	74.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles for all rail shipment; rail and water shipment less	93.50
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

	Percent Off List
1/2 in. & smaller x 6 in. & shorter	48
9/16 & 5/8 in. x 6 in. & shorter	50
All larger diam and longer lengths	47
Lag, all diam over 6 in. long	48
Lag, all diam x 6 in. & shorter	50
Plew bolts	57

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)	
1/2 in. and smaller	48
9/16 to 1 in. inclusive	47
1 1/4 to 1 1/2 in. inclusive	45
1 3/4 in. and larger	40

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for ear-load shipments.

Semifin. Hexagon Nuts USS SAE

	USS	SAE
7/16 in. and smaller	51	
1/2 in. and smaller	50	
1/2 in. through 1 in.	48	
9/16 in. through 1 in.	49	
1 1/4 in. through 1 1/2 in.	47	
1 3/4 in. and larger	40	

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts Consumer

Packages, nuts separate	65 and 10
In bulk	75
On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.	

Large Rivets (1/2 in. and larger)

	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$5.25
F.o.b. Lebanon, Pa.	5.40

Small Rivets (7/16 in. and smaller)

	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	55 and 5

Cap and Set Screws Consumer

	Percent Off List
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	56
1/4 to 1 in. x 6 in., SAE 1035, heat treated	47
Set screws, cup and oval points	61
Milled studs	33
Flat head cap screws, listed sizes	21
Fillister head cap, listed sizes	40
Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.	

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF ₂ Content:	Base price per short ton
70% or more	\$33.00
65% but less than 70%	32.00
60% but less than 65%	31.00
Less than 60%	30.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	\$5.95
Old range, nonbessemer	5.80
Mesabi, bessemer	5.70
Mesabi, nonbessemer	5.55
High phosphorus	5.55
Prices quoted retroactive to Jan. 1, 1947.	

METAL POWDERS

Prices in cents per pound in ton lots, f.o.b. shipping point.

Brass, minus 100 mesh	24¢ to 28 1/2¢
Copper, electrolytic, 100 and 325 mesh	30¢ to 31 1/2¢
Copper, reduced, 150 and 200 mesh	29¢ to 30 1/2¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe carlots	10¢ to 17¢
Swedish sponge iron, 100 mesh, c.i.f. N. Y., carlots, ocean bags	7.4¢ to 8.5¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots	5¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots	63¢ to 80¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe	35¢ to 37¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe	17¢ to 32¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe	90¢ to \$1.75
Aluminum, 100, 200 mesh, carlots	23¢ to 26¢
Antimony, 100 mesh	36.05¢
Cadmium, 100 mesh	\$2.00
Chromium, 100 mesh and finer	\$1.025
Lead, 100, 200, & 300 mesh	18.50¢ to 23.50¢
Manganese, minus 325 mesh and coarser	49¢
Nickel, 100 mesh	51 1/2¢
Silicon, 100 mesh	26¢
Solder powder, 100 mesh	8 1/2¢ plus metal
Stainless steel, 302, minus 100 mesh	75¢
Tin, 100 mesh	90¢
Tungsten metal powder, 98%-99%, any quantity, per lb.	\$3.05
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb.	\$2.65
Under 100 lb	\$2.90

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	\$11.50 to \$12.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	13.00 to 14.50
Foundry, Byproduct	
Chicago, del'd	\$17.10
Chicago, f.o.b.	16.10
New England, del'd	17.25
Seaboard, Kearney, N. J., f.o.b.	17.85
Philadelphia, f.o.b.	16.75
Swedeland, Pa., f.o.b.	16.75
Buffalo, del'd	18.25
Ashland, Ohio, f.o.b.	14.50
Painesville, Ohio, f.o.b.	16.60
Erie, del'd	16.75
Cleveland, del'd	17.90
Cincinnati, del'd	15.39
St. Louis, del'd	18.03
Birmingham, del'd	15.00

REFRACTORIES

(F.o.b. Works)

	Carloads, Per 1000
Fire Clay Brick	
No. 1, Ohio	\$64.00
First quality, Pa., Md., Ky., Mo., Ohio	70.00
First quality, New Jersey	75.00
Sec. quality, Pa., Md., Ky., Mo., Ohio	64.00
Sec. quality, New Jersey	59.00
No. 2, Ohio	56.00
Ground fire clay, net ton, bulk	10.00

	Per Net Ton
Silica Brick	
Pennsylvania and Birmingham	\$70.00
Chicago District and Alabama	79.00
Silica cement, net ton (Eastern)	12.00
East Chicago	13.00

	Per Net Ton
Chrome Brick	
Standard chemically bonded, Balt., Plymouth Meeting, Chester	\$59.00

	Per Net Ton
Magnesite Brick	
Standard, Balt. and Chester	\$81.00
Chemically bonded, Baltimore	70.00

	Per Gross Ton
Grain Magnesite	
Domestic, f.o.b. Balt. and Chester in bulk	\$44.50
Domestic, f.o.b. Chewelah, Wash., in bulk	24.00
in sacks	28.00
Clinker (dead burned) dolomite, bulk, per net ton, f.o.b. Billmeyer, Pa., Millersville, Ohio	10.50
Midwest, add 10¢; Mo. Valley, add 20¢	

PRICES

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	\$4.44	\$5.18	\$5.84	\$4.73	\$5.28	\$4.79	\$4.52	\$4.78	\$5.48	\$8.32	\$8.42	\$9.83	\$9.93
New York	4.67	5.67 ¹	6.07	4.97	5.80	5.02	4.72	4.97	5.52	8.37	8.47	9.87	9.97
Boston	4.70	5.57 ^{1,2}	5.50 ^{1,2}	4.70	6.71	6.71	4.77	4.92	5.57	8.57	8.67	9.92	10.02
Baltimore	4.29	.....	5.54	4.70	.....	.....	4.74	4.64	5.45	.....	.....	.....	.....
Norfolk	4.75	.....	.....	5.15	.....	.....	5.00	5.00	5.05	.....	.....	.....	.....
Chicago	3.65	.....	.....	4.05	5.05	.....	4.25	4.10	4.75	8.05	8.15	9.30	9.40
Milwaukee	4.099	4.899 ¹	5.249	4.199	.....	.....	4.399	4.249	5.10	8.399	8.399	9.649	9.649
Cleveland	3.95	4.55	5.238	4.168	5.00	.....	4.25 ¹	4.311	4.10	4.75	8.308	9.30	9.40
Buffalo	4.25	5.10	5.90	4.60	5.61 ⁵	.....	4.90	4.40	4.40	4.95	8.05	9.30	9.40
Detroit	4.35	5.20	5.42	4.64	5.59	.....	4.84 ¹	4.72	4.50	5.22	8.46	9.69	9.74
Cincinnati	4.471	5.166	5.166	4.694	.....	.....	4.903	4.744	4.703	5.403	.....	.....	.....
St. Louis	4.549	5.399 ¹	5.974	4.649	5.774	.....	4.899	4.699	4.699	5.424	8.524	9.774	9.874
Pittsburgh	4.25	5.10 ¹	5.65	4.35	4.95	.....	4.60	4.40	4.40	5.10	8.05	9.30	9.40
St. Paul	4.284 ⁷	5.084 ¹	5.434 ²	4.384 ⁷	.....	.....	4.584 ⁷	4.434 ⁷	4.434 ⁷	5.478 ⁶	7.084 ⁶	.....	.....
Omaha	4.868	6.118 ¹	6.468	5.168	.....	.....	5.418	5.218	5.218	5.918	.....	.....	.....
Indianapolis	4.51	5.29	5.84	4.61	5.46	.....	4.86	4.66	4.86	5.36	.....	.....	.....
Birmingham	4.45 ¹¹	5.80	5.80	4.45 ¹¹	.....	.....	4.65 ¹¹	4.40 ¹¹	4.40 ¹¹	.....	.....	.....	.....
Memphis	4.82 ¹¹	5.88 ¹¹	.....	5.02 ¹¹	.....	.....	5.17 ¹¹	4.97 ¹¹	4.97 ¹¹	5.88	.....	.....	.....
New Orleans	*4.98 ¹¹	6.29 ¹	.....	5.18 ¹¹	.....	.....	5.33 ¹¹	*5.03 ¹¹	*5.13 ¹¹	6.29 ⁶	.....	.....	.....
Houston	5.00	.....	6.36	6.00	.....	.....	5.85	5.85	5.35	6.25	.....	.....	.....
Los Angeles	5.65	7.35 ¹	7.30	5.95	8.70 ⁵	.....	5.40	5.50	5.40	7.25 ¹⁴	9.90	9.60	11.35
San Francisco	5.20 ⁸	.....	6.85	5.50 ⁸	.....	.....	.....	.....	.....	7.35 ¹⁰	.....	.....	.....
Seattle	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portland	5.30	.....	6.90	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salt Lake City	6.25	.....	7.50	6.75	.....	.....	6.10	6.25	6.35	7.40	.....	.....	.....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb;

strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 999 lb; (5) 2000 lb and over; (6) 1000 lb

and over; (7) 400 to 14,999; (8) 100 lb and over; (9) 450 to 1499; (10) 500 to 999; (11) 400 to 3999; (12) 450 to 3749; (13) 400 to 1999; (14) 1500 and over.

* Add 46¢ for sizes not rolled in Birmingham.

† Up to 3/4 in. thick and 90 in. wide.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

BASING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	37.00	37.50	38.00	38.50	.....	Boston	Everett	\$0.50 Arb.	.....	45.50	46.00	.....	.....
Birdsboro	40.00	40.50	41.00	41.50	45.00	Boston	Steelton	4.82	.....	.....	.....	.....	46.82
Birmingham	32.88-	33.38-	.....	.....	.....	Brooklyn	Bethlehem	3.00	40.00	40.50	41.00	41.50	.....
Buffalo	35.50-	36.00-	36.50-	.....	.....	Brooklyn	Birdsboro	3.50	.....	.....	.....	.....	48.50
Chicago	42.50	43.00	43.50	.....	.....	Cincinnati	Birmingham	4.87	37.75-	38.25-	.....	.....	.....
Cleveland	35.50	36.00	36.50	37.00	.....	Jersey City	Bethlehem	1.84	38.84	39.34	39.84	40.34	.....
Duluth	40.75	41.25	41.75	.....	.....	Jersey City	Birdsboro	2.33	40.75	41.25	.....	.....	47.33
Erie	36.00	36.50	37.00	37.50	.....	Los Angeles	Provo	5.94	42.94	43.44	.....	.....	.....
Everett	35.50	36.00	36.50	37.00	.....	Mansfield	Cleveland-Toledo	2.33	37.83-	38.33-	38.83-	39.33-	.....
Granite City	.....	45.00	45.50	.....	.....	Philadelphia	Bethlehem	1.67	38.67	39.17	39.67	40.17	.....
Neville Island	36.00	36.50	37.00	.....	.....	Philadelphia	Swedeland	1.01	42.01	42.51	43.01	43.51	.....
Provo	37.00	37.50	.....	.....	.....	Philadelphia	Birdsboro	1.49	41.49	41.99	42.49	42.99	46.49
Sharpville	36.00	36.50	36.50	37.00	.....	Philadelphia	Steelton	2.15	39.15	.....	.....	.....	44.15
Steelton	37.00	.....	.....	.....	42.00	San Francisco	Provo	5.94	42.94	43.44	.....	.....	.....
Struthers, Ohio	36.50	.....	.....	.....	.....	Seattle	Provo	5.94	42.94	43.44	.....	.....	.....
Swedeland	41.00	41.50	42.00	42.50	.....	St. Louis	Granite City	0.75 Arb.	36.25	37.25	37.25	.....	.....
Toledo	35.50	36.00	36.50	37.00	.....							
Troy, N. Y.	37.00	37.50	38.00	38.50	42.00								
Youngstown	36.00	36.50	36.50	37.00	.....							

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00

pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—\$45.50; f.o.b. Buffalo — \$46.75. Add \$1.25 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for 0.75

pct or more P. Bessemer ferrosilicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorous \$44.00 per gross ton, f.o.b. Lyles, Tenn. Delivered to Chicago, \$49.49. High phosphorous charcoal pig iron is not being produced.

FERROALLOY PRICES

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.

Carload lots (bulk)	\$135.00
Less ton lots (packed)	157.00
Delivered Pittsburgh	140.25

\$1.70 for each 1% above 82% Mn; penalty, \$1.70 for each 1% below 78%.
Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	7.00	7.25	7.80
Ton lots	8.00	8.60	10.50
Less ton lots	8.40	9.00	10.90

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn	19-21% Mn
	3% max. Si	3% max. Si
Carloads	\$46.00	\$47.00
F.o.b. Pittsburgh	50.00	51.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	30
L.c.l. lots	32

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.06% max. C, 0.06% P, 90% Mn	21.00	22.10	22.70
0.10% max. C	20.50	21.60	22.20
0.15% max. C	20.00	21.10	21.70
0.30% max. C	19.50	20.60	21.20
0.50% max. C	19.00	20.10	20.70
0.75% max. C			
7.00% max. Si	16.00	17.10	17.70

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk	6.65
Ton lots	7.70
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet	6.75
Ton lots	7.75
Less ton lots	8.15

Silvery Iron (electric furnace)

Si 14.01 to 14.50%, \$69.00 f.o.b. Keokuk, Iowa; \$70.00 f.o.b. Niagara Falls. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add 50¢ per ton for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

	Eastern	Central	Western
96% Si, 2% Fe	16.50	17.85	19.60
97% Si, 1% Fe	16.00	18.25	20.00

Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb Si briquets.

	Eastern	Central	Western
Carload, bulk	4.25	4.50	4.70
Ton lots	5.25	5.85	6.15
Less ton lots	5.65	6.25	6.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
25% Si	15.00	15.65	15.90
50% Si	7.80	8.30	8.50
75% Si	10.00	10.30	11.05
80-90% Si	11.30	11.60	12.35
90-95% Si	12.80	13.10	13.80

Ferrocchrome (65-72%Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	23.00	23.40	24.00
0.10% C	22.50	22.90	23.50
0.15% C	22.00	22.40	23.00
0.20% C	21.75	22.15	22.25
0.50% C	21.50	21.90	22.00
1.00% C	21.00	21.40	21.50
2.00% C	20.50	20.90	21.00

65-69% Cr,
4-9% C

15.60	16.00	16.15
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62-66% Cr, 4-6% C.
6-9% Si

16.60	17.00	17.15
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Briquets — Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk	9.85	10.10	10.20
Ton lots	10.75	11.65	12.25
Less ton lots	11.15	12.05	12.65

High-Nitrogen Ferrocchrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrocchrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrocchrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	16.70	17.10	17.25
Ton lots	17.90	19.20	20.00
Less ton lots	18.60	19.90	20.70

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

	Eastern	Central	Western
Carload	21.00	21.40	21.50
Ton lots	22.35	23.00	24.20
Less ton lots	23.35	24.00	25.20

Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed, 97% min. Cr, 1% max. Fe.

	Eastern	Central	Western
0.20% max. C	83.50	85.00	86.25
0.50% max. C	79.50	81.00	82.25
9.00% min. C	79.50	81.00	82.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	14.00	14.50	16.55
Ton lots	16.10	16.85	19.00
Less ton lots	17.10	17.85	20.00

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	15.50	16.00	18.05
Ton lots	17.60	18.45	20.20
Less ton lots	18.60	19.45	21.20

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast Turnings Distilled
Ton lots	\$1.60 \$2.35 \$2.95
Less ton lots	1.95 2.70 3.75

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

	Eastern	Central	Western
Ton lots	16.00	17.10	19.05
Less ton lots	16.75	17.85	19.80

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

	Eastern	Central	Western
Ton lots	14.25	15.35	17.30
Less ton lots	15.00	16.10	18.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa. York, Pa., per pound contained W, 5 ton lots, freight allowed... \$2.50

Ferrovandium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.

Openhearth	\$2.70
Crucible	\$2.80
High speed steel (Primos) ..	\$2.90

Vanadium pentoxide, 88-92% V₂O₅ technical grade, contract basis, per pound contained V₂O₅... \$1.10

Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb

Ton lots	\$2.50
Less ton lots	\$2.55

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. 95¢

Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. 80¢

Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo. 80¢

Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo. 80¢

Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y. ton lots, per pound contained Ti

Less ton lots	\$1.23
Less ton lots	\$1.25

Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti

Less ton lots	\$1.35
Less ton lots	\$1.40

High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton.... \$142.50

Ferrophosphorus, electrolytic, 23-26% carlots, f.o.b. (Siglo) Tenn., \$3 unitage per gross ton \$65.00

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.

Carload lots	17.00¢
--------------------	--------

Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy

Carload, bulk	5.50¢
---------------------	-------

Aisifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carload	6.50¢
Ton lots	7.00¢

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Car lots	9.00¢
Ton lots	9.75¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.

Ferroboration, 17-50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
Less ton lots	\$1.30	\$1.3075	\$1.329

Manganese — Boron 75.00% Mn, 15-30% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

Ton lots	\$1.89	\$1.903	\$1.935
Less ton lots	2.01	2.023	2.044

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots	\$2.10	\$2.1125	\$2.1445
---------------------	--------	----------	----------

Silcaz, contract basis, f.o.b. plant freight allowed, per pound.

Carload lots	35¢
--------------------	-----

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.

No. 1	87.5¢
No. 6	60¢
No. 79	45¢

Bortram, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

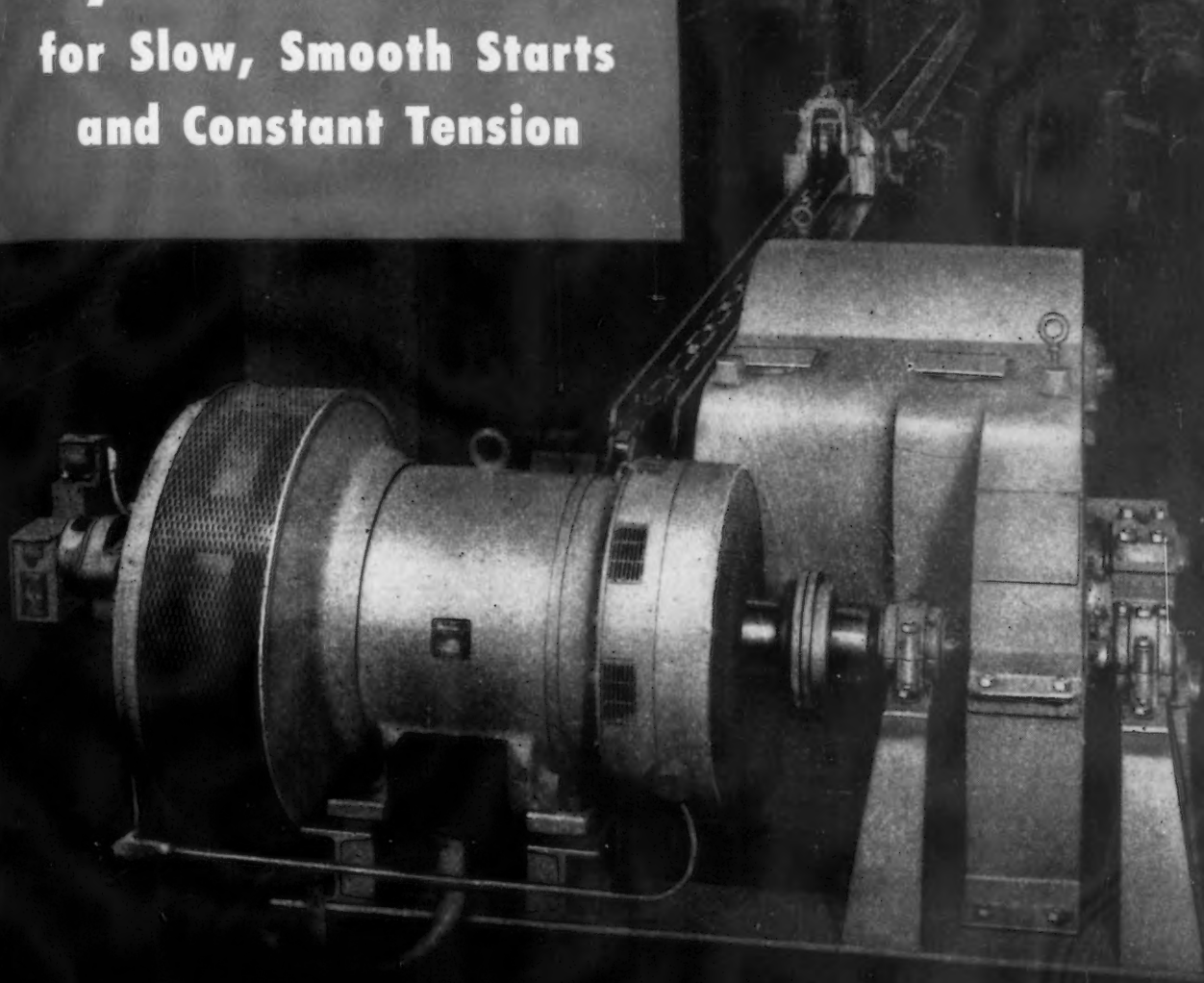
Carbotam, f.o.b., Suspension Bridge, N. Y., freight allowed, Ti 15-17%, B 0.90-1.15%, Si 2.5-3.0% Al 1.0-2.0%.

Ton lots, per pound	8.00
---------------------------	------

.50
 2.70
 2.80
 2.90
 1.10
 2.50
 2.55
 95¢
 80¢
 80¢
 80¢
 \$1.23
 \$1.25
 \$1.35
 \$1.40
 42.50
 65.00
 7.00¢
 5.50¢
 6.50¢
 7.00¢
 9.00¢
 9.75¢
 alloy,
 lowed.
 max.
 eastern
 1.329
 5-20%
 3.00%
 .935
 2.044
 max. Al.
 3.00%
 \$2.1445
 35¢
 87.5¢
 60¢
 45¢
 45¢
 50¢
 8.0¢

Dynamatic Drives

for Slow, Smooth Starts and Constant Tension



Dynamatic electro-magnetic drives,
 brakes, and couplings can be applied
 to any shaft in any type of machine to
 transmit motion or braking action from
 one rotating member to another without

mechanical contact, friction, or shock,
 and under complete control. Particu-
 larly adaptable to draw-benches, wire-
 drawing machines, plastics extruders,
 and so on. Inquiries invited.



CORPORATION • KENOSHA, WISCONSIN

Subsidiary of **EATON MANUFACTURING COMPANY** Cleveland, Ohio



**HOW TO GET A
"CUSTOM-BUILT" HOIST
AT NO EXTRA COST**



At no extra engineering cost, you can have a Reading Electric Hoist that's CUSTOM-BUILT to solve your special materials handling problems.

The Reading Unit Construction Plan gives you a choice of several standard interchangeable mechanisms. With this plan you can select the type of suspension, control, hoisting and motor unit that best suits your job requirements. Imagine the advantages you get in a hoist "tailor made" to your own specifications! If your operating conditions change, you can modernize—and save costs—by simply changing one or two units.

See your distributor for more information on Reading's Unit Construction Plan or write us today for your copy of "144 Answers To Your Hoisting Problems."

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2101 ADAMS ST., READING, PA.
CHAIN HOISTS • ELECTRIC HOISTS
OVERHEAD TRAVELING CRANES

**READING
HOISTS**

Fatigue Cracks

BY C. T. POST

Navy Language

•• The Navy communications experts at 100 E. 42nd St. are trained to speak of advertisers in hushed tones, but privately they're very much troubled by that Luria Brothers ad (July 31, p. 23) showing the world's largest battleship. (It took four years to build but America's steel furnaces could gobble it up as scrap in six hours.)



The hull design as pictured passed the review board satisfactorily on the grounds that it was seen from a life raft. There was some balking at the gun arrangement, but the signal flag arrangement really made the tars wriggle. It seems that altogether too many flags are *at the dip* (half way down the ropes, to us) unless the battlewagon is starting to send a message to three different ships at one time. And, if that lonely little flag on the tip-top flag pole is supposed to be the ship's ensign (it shouldn't be there at all), what is it doing at half mast? Maybe the signal officer just died.

No Dear

•• The Society for the Abolition of Dear in Business Letters, we regret to report, seems to be gaining some headway. This vicious attempt to still the deepest emotions in the commercial breast propagandizes by means of stickers attached to letters. The idea is that you start right off with "American Telephone & Telegraph Co., you old rascal, I never called Denver on July 17 . . ." A.T.&T. might recover from such lack of affection after rocking back and forth on its corporate heels for five minutes. But what would you do about the letter we received this morning from Mr. J. Grundy:

"I would like you to know that I think (IRON AGE) is the best magazine of its type I

have yet seen. Most magazines . . . are either too highly technical to be understood by the average engineer, or they are so full of advertisements that one loses interest . . . It has been a real treat to handle a well presented magazine printed on good paper . . ."

Now how could we ever salute Mr. Grundy without starting off, "DEAR Mr. Grundy:"?

The Mainspring

•• If Associated Spring Corporation's back hasn't already reached the yield point from taking so many bows, it should come out for another curtain call on its publication, "The Mainspring." Unrelieved discussion of the engineering aspects of spring applications could be pretty heavy for our limited ken. But, in place of the usual graphs sprinkled with Greek sym-



"a 'pick-up' may be tried"

hols, The Mainspring's technical illustrations (like the ones shown here) speak a universal language.



"ground ends meet the requirements"

We just look at the drawings, and right away all the mathematical formulas become crystal clear to us—translucent, anyway.

The CONE AUTOMATIC MACHINE COMPANY



sees many

GOOD THINGS AHEAD

It is reported that

White Sewing Machine Co. stores its lumber on wheels, thus reducing the number of handlings from six to one.

get ready with CONE for tomorrow

Chesapeake and Ohio is planning to buy a thousand freight cars equipped with roller bearings.

be ready with CONE for today

Commonwealth Edison Co. has a "cyclone" burner in its Calumet Station that removes 80% of the coal ash as molten slag in the burner.

get ready with CONE for tomorrow

Britain's Southern Railroad is laying track in complete pre-fabricated 60-foot sections.

be ready with CONE for today*

Caterpillar Tractor Co. is using electronic rectifiers in place of motor-generator sets to convert AC current to DC for the operation of machine tools.

get ready with CONE for tomorrow

Manuel Gonzales, a Civil Engineer of Mexico City, builds multiple story, poured concrete buildings by laying the top floor first and suspending the forms for each floor from the one above.

be ready with CONE for today

Timken-Detroit saves 400 pounds in the weight of its new heavy-duty tandem truck axle by using aluminum in housing, hubs and brake-shoes.

get ready with CONE for tomorrow

DuPont is building a plant at Niagara Falls to make furfural from farm waste. The furfural will be made into Nylon.

be ready with CONE for today

American Optical Company has a new glass which absorbs 90% of yellow light and which is expected to be useful in goggles for workmen fusing glass in a sodium flame.

get ready with CONE for tomorrow

Simonds Saw & Steel Co. has a new dial indicator that registers the tension on a hack saw blade.

Electronic heating equipment made by Induction Heating Corp. reduces to seconds the time required to bake foundry sand cores.

be ready with CONE for today

A radiation counter that operates over a wider range than the familiar Geiger counter has been developed by Westinghouse.

get ready with CONE for tomorrow

Verdi Bros. of Jersey City are bringing the old-fashioned oak beer keg up to date by making it of nine-ply laminated wood.

be ready with CONE for today

The Armzen Co., of Middletown, Ohio, has designed a miniature cold strip mill for Westinghouse to roll their new magnetic alloy "Hiperco" as thin as .002 in.

A method of electroplating, in which the current is periodically reversed, has been developed by Westinghouse. The deposited film is said to be more dense and so smooth as to require no polishing.

get ready with CONE for tomorrow

Detroit Diesel Engine Div. of General Motors is in production on a new hydraulically operated transmission for their engines.

be ready with CONE for today

Pezzillo Pump Co. is making an electric pump that can be installed directly in a pipe line like any other fitting. The impeller and rotor are integral and the liquid flows through the motor.

get ready with CONE for tomorrow

A possible answer to the need for heat and stress resistant material for gas turbines, jets and rockets is a new crystalline porcelain announced by the U. S. Bureau of Standards.

FOLLOW THESE PAGES FOR NEWS OF PROGRESSIVE PRODUCTION

CHICAGO SHOW

CONOMATIC REVIEW

This page, September issue, will feature

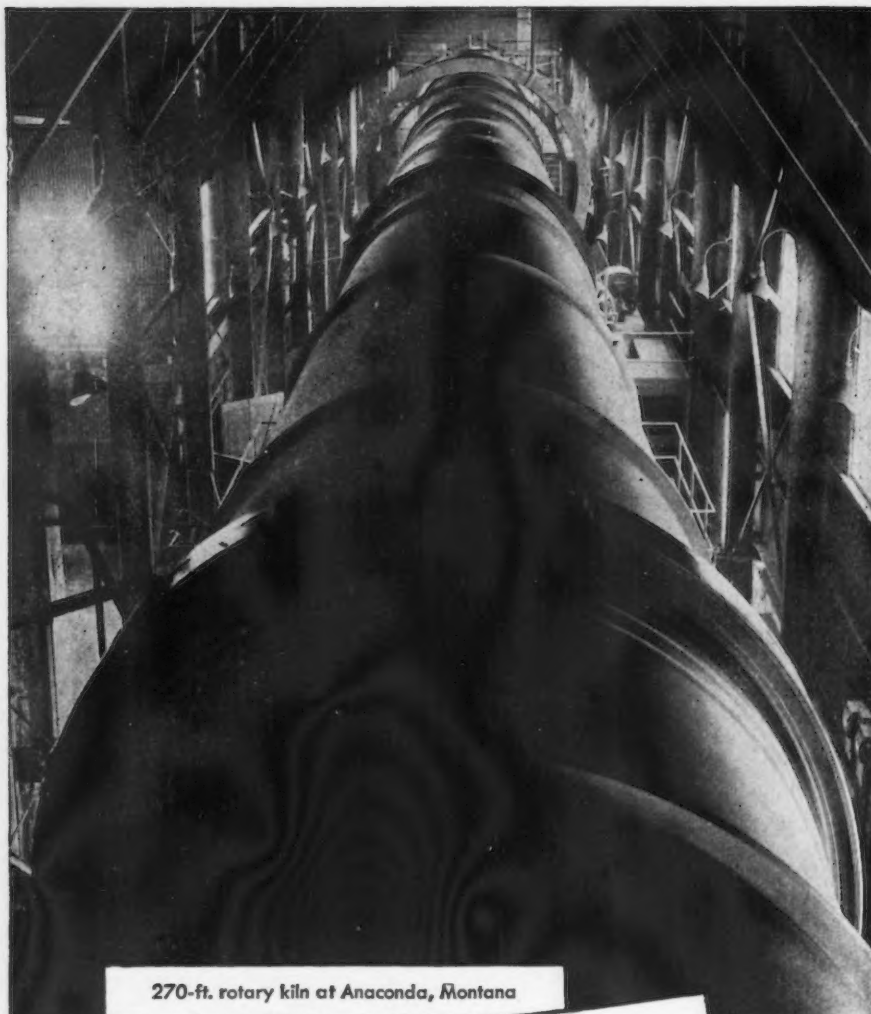
NEW

MODELS

innovations — improvements

CONE

AUTOMATIC MACHINE CO., INC. * WINDSOR, VERMONT, U. S. A.



270-ft. rotary kiln at Anaconda, Montana

Anaconda MANGANESE NODULES

AVERAGE ANALYSIS

Mn	60%
SiO ₂	8%
Al ₂ O ₃	0.76%
Fe	3.1%
P	0.06%

46381



ANACONDA COPPER MINING COMPANY

Offices: 25 Broadway, New York 4, N. Y.

Anaconda, Montana

Dear Editor:

STEEL DRUM PRODUCTION

Sir:

The statistical information in the May 29 issue, p. 114, showing heavy steel drum production . . . shows the Granite City Steel Co. in 1946 furnished 6.3 pct of this commodity . . . We would like to advise that the Granite City Steel Co. does not produce any 19-gage and heavier drum sheets. We did not produce any of this commodity in 1946 and, furthermore, we have never been a factor in this market . . .

J. L. HAMILTON
Assistant General Manager of Sales
Granite City Steel Co.,
Granite City, Ill.

● As explained in the footnote accompanying the statistical table referred to above, the published figures were presented to a Senate sub-committee by the assistant chief economist of FTC. However, an inadvertently omitted footnote should have called attention to the fact that FTC figures for Granite City were based on that agency's allegation of "community of interest based largely on the fact that Hayward Niedringhaus is (1) owner of Niedringhaus Metal Products Co., (2) principal owner and director of National Enameling & Stamping Co., and (3) president of Granite City Steel Co.," which amounts to "aggregate capacity in a single control." Since the publication of the table, THE IRON AGE has been informed on the behalf of Mr. Niedringhaus that he does not own any stock or other interest in Niedringhaus Metal Products Co. and only 200 (of 114,775 outstanding) shares of National Enameling & Stamping Co. stock.—Ed.

DILEMMA GERMANICA

Sir:

It is with great satisfaction that I submit my thanks to you, Sir, for your distinguished editorial "Dilemma Germanica" in the May 22 issue. May the help of the U.S.A. be full of hope and usefulness for the recovery of Germany, Europe and the world! I am sure a great deal of good can come from it. I unite herewith my wishes for a new, happy, prosperous and peaceful world.

Berlin-Spandau
Germany

A. KOCH

EXPOSITIONS

Sir:

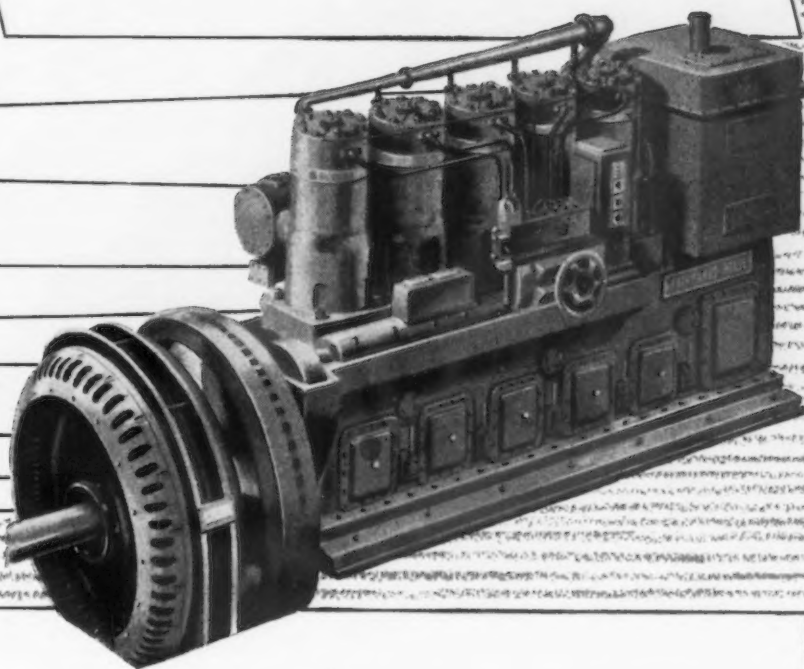
Would it be possible to let me know what sort of expositions the Porcelain Enamel and National Metal are? What I would like to know is whether these shows are the wares of these manufacturers or if they are only conferences.

G. C. PAYETTE
Dominion Decalcomania Co.

● Both expositions are of long standing and are always well attended. The Porcelain Enamel Institute annual meeting will be held at Cleveland, Oct. 9-10 and the

In Case After Case,

**FAIRBANKS-MORSE
DIESEL PERFORMANCE IS PROVED**



IT'S the usual thing for Fairbanks-Morse Diesels to turn in consistently outstanding records of performance. Time and again, users in every industrial field report low maintenance, low fuel cost, and dependable operation under sustained, heavy-duty service, with Fairbanks-Morse Diesels.

It is an outstanding combination of diesel performance features—but it is all the more outstanding when you know that Fairbanks-Morse Diesels continue

operating this way, year in and year out. Their performance records prove this conclusively.

What Fairbanks-Morse Diesels have done elsewhere, they can do for you, too. Remember—diesels, above all other power sources, deliver the most energy per gallon of fuel oil. Write today for the complete story of Fairbanks-Morse Diesel economies. Fairbanks, Morse & Co., Chicago 5, Illinois.

Fairbanks-Morse



A name worth remembering

Diesel Locomotives
Diesel Engines
Generators • Motors
Pumps • Scales
Magnets • Stokers
Railroad Motor Cars
and Standpipes
Farm Equipment



Grinding operations are easy when you use a Stearns Grinder Holding Magnet. Grips your material securely, safely, efficiently—a very flexible job that will cut your costs. Saves time of chucking up, makeshift jigs and clamping devices. Ask for information on the Stearns Grinder Holding Magnet.

Also—Stearns Magnetic Pulleys, Drums, Separators. Widely used for sand treatment, reclaiming of metals. Stearns Lifting Magnets for moving material.



Stearns

MAGNETIC MFG. CO.

Separators
Drums - Pulleys
Clutches - Brakes
Magnetic Equipment

635 So. 28th Street
Milwaukee 4, Wis.

See Stearns Magnetic at the Chicago Tool Show

National Metal Exposition at Chicago, Oct. 18-24. Details of both the metal and P.E.I. shows will be published in THE IRON AGE preceding the meetings.—Ed.

ALUMINUM SIDING

Sir:

I am interested in the item in Newsfront of the July 17 issue which discusses "aluminum siding fabricated with a slightly concave facing that permits it to be nailed directly to studs or sheathing on the side of a house—under tension." Will you let me know where I can find out more about it?

FREDERICK S. FOLTZ
Foltz Wessinger, Inc.
Lancaster, Pa.

● The aluminum siding is a product of the International Roll Forming Co., 64 Wall St., New York.—Ed.

SIR HENRY BESSEMER

Sir:

The American National Geographic Magazine has asked me to locate a number of historical paintings for use in illustrating a special issue . . . We should like to include a picture of Sir Henry Bessemer but so far have found only portraits. Do you have any paintings which have been done for THE IRON AGE, or do you know of any others, which show him at work, preferably on his steel process? We are anxious to locate the original paintings because we wish to reproduce them in color. We should, of course, acknowledge the source of any picture we use in reproduction.

FRANCES W. JAMES
10 Lowndes St.
London, S.W.1

● We regret we have none of Sir Henry, but perhaps some of our readers know of such a painting.—Ed.

STEEL PUTTY KNIFE

Sir:

We desire to manufacture a steel putty knife. The blade which we plan to use on this knife will be made from SAE 1075 spring steel. We desire to grind this blade from 0.050 stock on a taper to 0.025 thickness. The grinding will have to be done on a production basis since the quantity involved exceeds 200,000 pieces. We desire information as to whether a blade with the taper shape can be produced on a forging or coining press if this is the most economical method of production. Also, if this blade cannot be produced on the above equipment, we desire to know the best and most economical method for grinding the blade to the taper shape.

I. C. FRIEDMAN
Federal Auto Products Co., Inc.
Chicago

● A putty knife can be made by at least four methods. We do not believe coining is practical as 1075 hot-rolled strip in the gage you mention would come off the mill

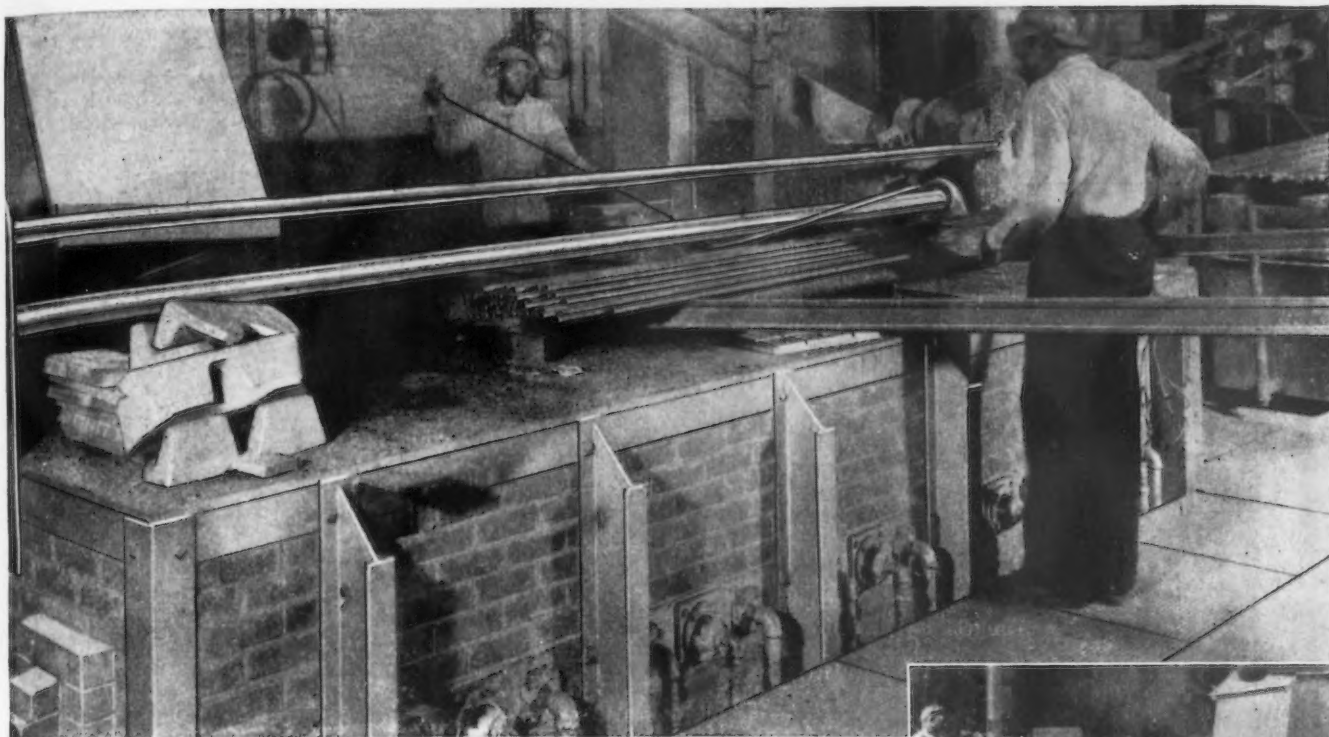
No. 75
of a
Series
of Typical
Installations

Sunbeam STEWART

THE BEST INDUSTRIAL FURNACES MADE

For GALVANIZING CONDUITS

AT CLIFTON CONDUIT CO., BALTIMORE, MD.



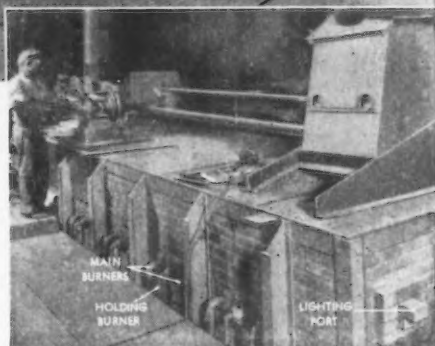
Kettle dimensions of the Sunbeam Stewart High Side Fired Setting used by Clifton for galvanizing conduits are 40" x 48" x 13'. It is a high-side, gas-fired unit with baffle protection for the kettle.

SUNBEAM STEWART GALVANIZING SETTINGS GIVE YOU LOWER DROSS LOSS • LONGER KETTLE LIFE • HIGHER PRODUCTION

For the manufacture of conduits, Clifton required a setting that could provide a close temperature control of spelter. The reason: Their finished pipes had to have a smooth interior (to prevent a spur from stripping the wire insulation) and an outside dimension that adhered to a close dimensional tolerance (pipes were used with threadless fittings).

The Galvanizing Division of Clifton Conduit Co. has met these requirements with a Sunbeam Stewart setting. Kettle dimensions are 40" x 48" x 13'. The Sunbeam Stewart principle of High

Side Firing provides the necessary close temperature control of spelter and even heat distribution. Burners fire against a protective baffle and provide a uniform flow of hot combustion gases to the upper part of the kettle. The gases travel downward to a point slightly above the dross where they are exhausted. This type of design assures (1) long kettle life; (2) close control of spelter temperature; and (3) allows maximum production per cubic foot of spelter. Moreover, by heating from the top and exhausting at a point near the



Two zone burner control of the Sunbeam Stewart setting provides a flexible unit. Holding burners keep spelter in a molten condition while setting is idle.

bottom, a cleaner spelter results. Dross is held to a minimum.

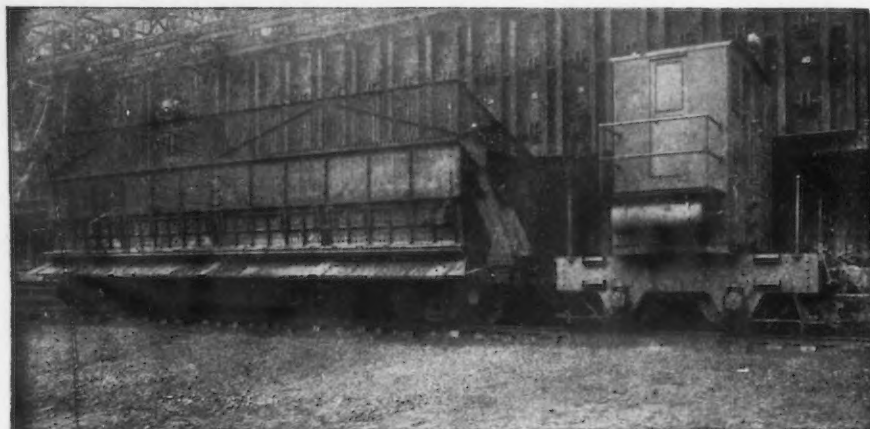
Clifton's Galvanizing setting is typical of the many designed by Sunbeam Stewart to meet specific production requirements. In addition, Sunbeam Stewart builds a full line of standard furnaces.

SUNBEAM STEWART INDUSTRIAL FURNACE DIVISION of SUNBEAM CORPORATION

(Formerly CHICAGO FLEXIBLE SHAFT CO.)

Main Office: Dept. 110, 4433 Ogden Ave., Chicago 23 — New York Office: 11 W. 22nd St., New York 18 — Detroit Office: 308 Boulevard Bldg., Detroit
Canada Factory: 321 Weston Rd., So., Toronto 9

COKE OVEN EQUIPMENT



QUENCHING CARS AND LOCOMOTIVES

All Atlas Coke Oven Equipment is of heavy-duty construction permitting the peak operating conditions required in today's stepped-up production schedules. As a result of years of experience, Atlas is able to design and build equipment, to meet the requirements of each particular coke plant. Detailed information available on request.

Other ATLAS Products

Ore Transfer Cars	Locomotives for
•	Switching and Interplant
Scale Charging Cars	Haulage
•	•
Electrically Operated Cars for Every Haulage Purpose	Turntables

The **ATLAS CAR & MFG. CO.**

ENGINEERS MANUFACTURERS

1100 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

at around 30 Rc hardness. Although this material could be coined, a sizeable press and therefore a large investment would be involved. It might be possible to order the 1075 material in double width and some of the strip mills might be willing to furnish the stock with a crown thickness of 0.050 in. tapering to 0.025 in. at the edge. The part could then be blanked out at right angles to rolling, which would preclude your having to grind a taper. If production were great enough a jump mill or an eccentric rolling mill for rolling different diameter rounds could be used to furnish the taper required. As a last resort, regular narrow strip could be purchased and a hot pressing operation could be used to produce the taper. From here the part could be blanked. This method would mean that a blast cleaning or pickling operation would have to be included to clean off the scale. We are forwarding the names of several manufacturers of putty knives who could probably give you further information.—Ed.

BOILER PLATE ROLLER

Sir:

We are interested in obtaining more information on the Webb boiler plate roller set up in the Hobart Trade School, as pictured in the June 5 issue, p. 121.

E. I. GUDELJ

Pacific Pipe Co.
San Francisco

• The machine was manufactured by the Webb Corp., Webb City, Mo.—Ed.

CLOSER FITS

Sir:

Do you have reprints of the article entitled "How to Increase Tolerances and Obtain Closer Fits" which was in the July 3 issue? A few copies for use in our plant educational program would be appreciated.

ROBERT D. HILT
Q. C. Statistician

Telechron, Inc.
Ashland, Mass.

OIL PURIFICATION

Sir:

In the Apr. 3 issue, there appeared an article by Brian Corrigan entitled "Oil Purification, Filtration and Reclamation" and we would like to know if it is possible to obtain a reprint of this article.

F. C. HUETTNER
Purchasing Dept.

Dallas Div.
Revere Copper & Brass Inc.
Chicago

MAGNESIUM RESEARCH

Sir:

In the Mar. 13 issue, you state that a series of 45 reports on magnesium research are available to industry through the Office of Technical Services, Washington. I would appreciate your mailing me a complete listing of all the reports available, together with information on cost of copies.

J. W. STEINMEYER
Research Engineer

American Car & Foundry Co.
New York

• We are forwarding the complete listing of reports available covering wartime re-

Q



Why did "live" manufacturers invest over \$1,500,000 in the past 12 months for Sciaky *Three-Phase* welders?

A



Because *Three-Phase* is the answer to these long-standing resistance welding problems:



WELDERS USE 75% LESS LINE CURRENT



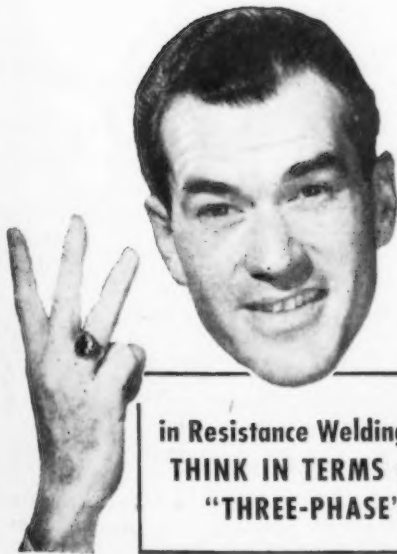
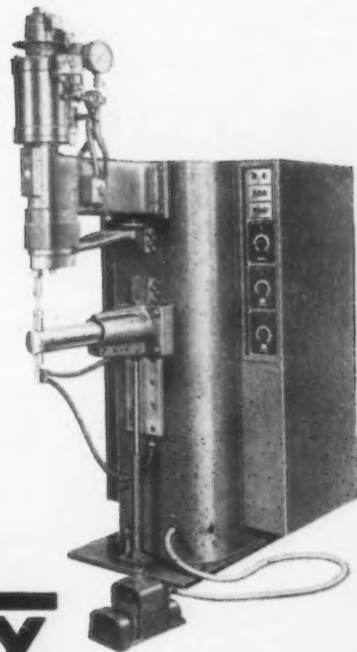
ON A BALANCED THREE PHASE LOAD



AT NEAR UNITY POWER FACTOR

Further advantages offered by this revolutionary achievement in electronics are: elimination of "flicker" on the line, high versatility—machines can weld aluminum, magnesium, brass, etc., high efficiency is not affected by variation in throat depth or masses of steel introduced into the throat.

Get the details on *Three-Phase*. Write for Bulletins 136 and 137-A.



in Resistance Welding—
THINK IN TERMS OF
"THREE-PHASE"

SCI AKY

SCI AKY BROS., Inc.

4913 W. 67th ST., CHICAGO 38, ILL.

TAKE IT FROM **CRIMPY**
THE BUFFALO WIRE CLOTH MAN



"There's Nothing Like
'BUFFALO' PLAIN STEEL
WIRE CLOTH for All Around
Strength and Low Cost."

**MY WIRE IS
FINEST GRADE STEEL**

... each size is carefully selected from our choice of the nation's best mills. That accounts for my extraordinary weaving and crimping qualities.



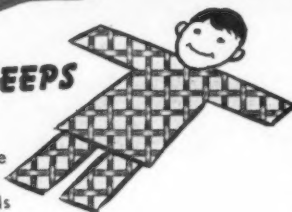
**MY MESH IS ALWAYS
ON THE BUTTON**

... never misses ... always accurate ... and I have just about the largest variety of weaves in the business ... from round or flat wire.



**MY DEEP CRIMP KEEPS
MY MESH RIGID**

... holds it firmly in place ... gives me long life. I'm crimped many ways for all kinds of service.



I'M WOVEN IN MANY SIZES

... of meshes and wires for every industrial need.



Check your files for our **INDUSTRIAL WIRE CLOTH CATALOG**. If you haven't a copy, you can get one by dropping us a line.

Buffalo WIRE WORKS CO., INC.

Manufacturer of All Kinds of Wire Cloth Since 1869

456 TERRACE

BUFFALO 2, N. Y.

search on magnesium metallurgy. Orders for these reports should be addressed to the Office of Technical Services, Dept. of Commerce, Washington 25, D. C., and should be accompanied by check or money order, payable to the Treasurer of the U. S.—Ed.

PLASTIC COATING

Sir:

We should like to obtain any available information relative to plastic coating which is sprayed on stainless steel as reported in the May 15 issue. The article was "Plastic Coating Expedites Stainless Stamping Operations."

H. B. HYDE
Plant Buyer

Rayon Div.
E. I. du Pont de Nemours & Co.
Richmond, Va.

● For further information write to Better Finishes & Coatings, Inc., 268 Doremus Ave., Newark 5.—Ed.

FIFTY COPIES NEEDED

Sir:

Please send 50 copies of the Directory of Tool Steels.

H. N. BRUCE
Latrobe Electric Steel Co.
Detroit

● The directory is available to subscribers at \$2.00 each for one or two copies; \$4.50 for three copies; \$1.00 each for six or more copies.—Ed.

DIMPLED STAINLESS

Sir:

Can you refer us to any source that can furnish stainless steel sheet, about 18 gage, with a dimpled or corrugated surface. Our requirements are too small to warrant any production order. If you can refer us to any source that dimples sheet materials, we may be able to find what we need.

J. J. BOBROW
Purchasing Agent

Man-Sew Corp.
New York

● Several possibilities are available. We are forwarding the names of fabricators of such material.—Ed.

DOORKNOBS

Sir:

If possible we would appreciate having tear sheets of the article, "Doorknob Production Accelerated by Ingenious Tooling," in the July 24 issue, pp. 56 to 61.

P. F. DENARD
E. W. Bliss Co.
Brooklyn

EXPANSION REAMERS

Sir:

We are interested in the import of expanding reamers and request a list of manufacturers of these reamers.

H. V. INTERMETAAL
Rotterdam

● A list of some of the larger companies who manufacture expansion reamers is being sent.—Ed.